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# THE JOURNAL OF GEOGRAPHY

VOLUME XLIX  
1950

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PUBLISHED BY  
A. J. NYSTROM & COMPANY  
3333 ELSTON AVENUE, CHICAGO 18, ILLINOIS  
FOR  
THE NATIONAL COUNCIL OF GEOGRAPHY TEACHERS

# The JOURNAL of GEOGRAPHY

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The JOURNAL is the official organ of the National Council of Geography Teachers and is sent to all members. The annual dues, \$3.00, are payable to the JOURNAL OF GEOGRAPHY. Extra postage rates for copies sent to foreign countries should be added to the membership dues. Make all remittances payable to the JOURNAL OF GEOGRAPHY, in postal or express money orders or bank drafts.

Send manuscript and books for notice or review to the *Editor*.  
Send orders for back numbers to JOURNAL OF GEOGRAPHY.

*Published monthly except June, July and August*

PUBLICATION OFFICES: 450-454 AHNAIP STREET, MENASHA, WISCONSIN

Business Correspondence, Membership Dues, and Subscriptions may be sent to  
Publication office or to

**A. J. NYSTROM AND COMPANY**  
PUBLISHERS, JOURNAL OF GEOGRAPHY  
3333 ELSTON AVENUE, CHICAGO 18

Entered as second-class matter January 15, 1919 at the post office of  
Menasha, Wisconsin under the Act of March 3, 1879.

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Annually two prizes, of \$25.00 each, are awarded for outstanding articles published in the JOURNAL in the previous five years. The prizes collectively cover most aspects of geography and geographic education. They honor the author and a person who contributed notably to the success of the JOURNAL. The prize awards are named in honor of the following: Richard E. Dodge, Ray H. Whitbeck, George J. Miller, J. Paul Goode, Almon E. Parkins, Ellsworth Huntington, Isaiah Bowman, and Cora P. Sletten.

# The Journal of Geography

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# *The* JOURNAL of GEOGRAPHY

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VOLUME XLIX

JANUARY, 1950

NUMBER 1

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## THE SONOYTA OASIS

RONALD L. IVES

Indiana University

### INTRODUCTION

Recent studies of Mexico, and of Mexican life, have been concerned largely with the central plateau area, and, in large part, have neglected the numerous smaller communities in the arid northern part of the Republic. Many studies of Mexico, also, have over-emphasized the strange, exotic, and weird cultural and religious developments in a very few isolated mountain villages, and have neglected the large number of Mexican communities which, because of stable government and economy, do not figure regularly in the news.

This misplacement of emphasis has created the impression, in some circles, that Mexico is an interesting land, where everything is done in a peculiar, or even psychotic, manner; and where straight-forward, sensible, normal methods are not used. Such an impression is not only false, but most unfortunate, for the average Mexican community is a thoroly orderly social and economic entity, in which life goes smoothly and pleasantly; much as it does in the average community in most other parts of the world.

Representative of a large number of northern Mexican communities is Sonoyta, Sonora, a town having a long pre-history, amply demonstrated by archaeological evidence: and a written history dating back to 1698, when Eusebio Francisco Kino, the "Apostle to the Pimas," visited the settlement, introduced cattle-raising, and built the San Marzelo Sonoita Mission. Material to be presented here was collected during the period 1931-1946, inclusive, and has been augmented considerably by inclusion of statistical data supplied by the Mexican Government.

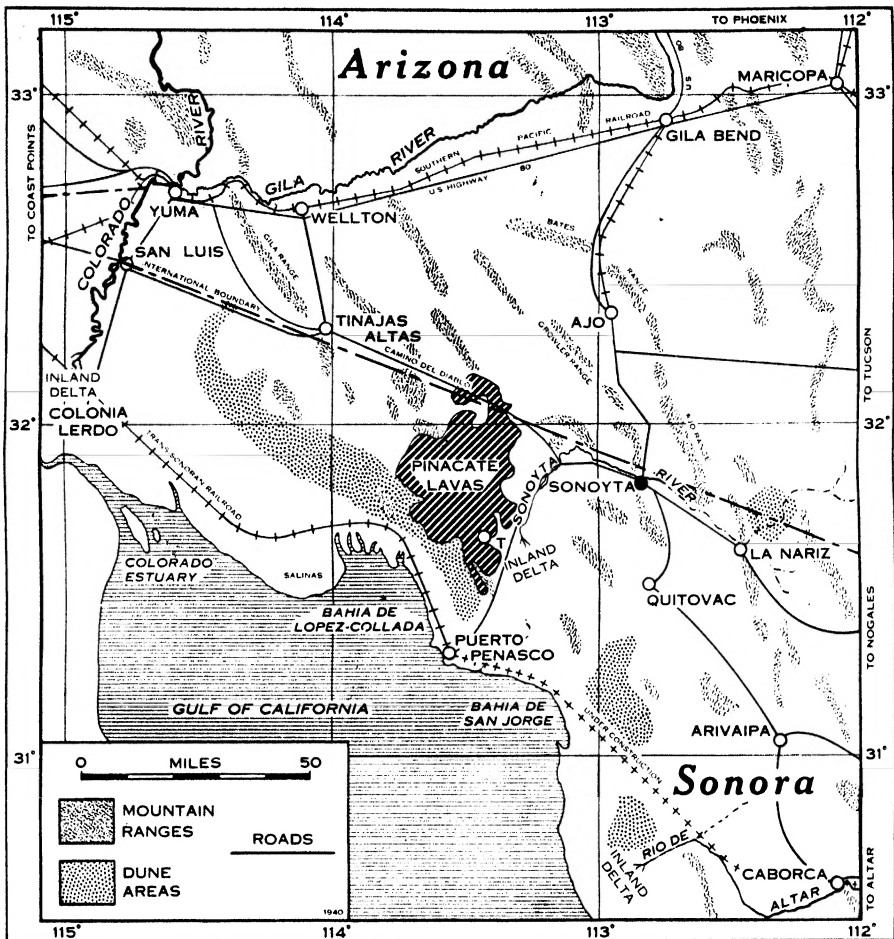


FIG. 1. Summary map of the borderlands between the Gila and Altar rivers, showing location of Sonoyta.

### LOCATION AND ACCESSIBILITY

Sonoyta<sup>1</sup> is centrally located on the course of the Sonoyta River, a small desert stream which rises on the west side of the Baboquiviri Range, west of Tucson, Arizona, and evaporates on an inland delta east of the Pinacate Lava Flows; at latitude  $31^{\circ}50'$  N.; longitude  $112^{\circ}51'$  W.; altitude 1155' above MSL, approximately.

By road, Sonoyta is about 40 miles south of Ajo, Arizona; 116 miles west of Nogales, Arizona—Sonora; 112 miles east of San

<sup>1</sup>The name *Sonoyta*, which is rendered *Sonoita* on many Mexican maps, and *Sonoítac* in the older mission documents, is apparently derived from the Papago descriptive terms *Kávortkson* (*Kávortk* = rounded hill; *son* = at the foot of), commonly degraded to *son*; and *óitac* (*óitac* = fields).

Luis, Sonora, on the Colorado River; and 102 miles northwest of Altar, Sonora, regional administrative center.

Until road improvements were made about 1925, Sonoyta was a two-day horseback trip, or a three-day wagon journey, from the railhead at Ajo, Arizona. Now, in most seasons, the journey takes two hours. Rapid travel in the region is now possible via the Altar—Sonoyta—San Luis airline, reportedly operating on a twice-a-week each way schedule; and bus travel from Sonoyta to any Mexican point is now possible almost daily.

Location of Sonoyta with regard to major physiographic features, principal roads and railroads, and political boundaries, is shown in Fig. 1.

#### PHYSICAL SETTING

Sonoyta is located in a pocket, between several groups of fault-block mountains. To the north, the volcanic Sierra de Sonoyta rises more than 1,000 feet above the townsite; and to the south the granite and schist Sierra de Cubabi rises more than 4,000 feet. Outliers of both ranges form a partial enclosure to the east of the present townsite.

Bifurcating this scoop-shaped depression is the channel of the Sonoyta River, which is deeply trenched in bedrock to within a few miles of the townsite on the east, and shallowly trenched into alluvium to the west.

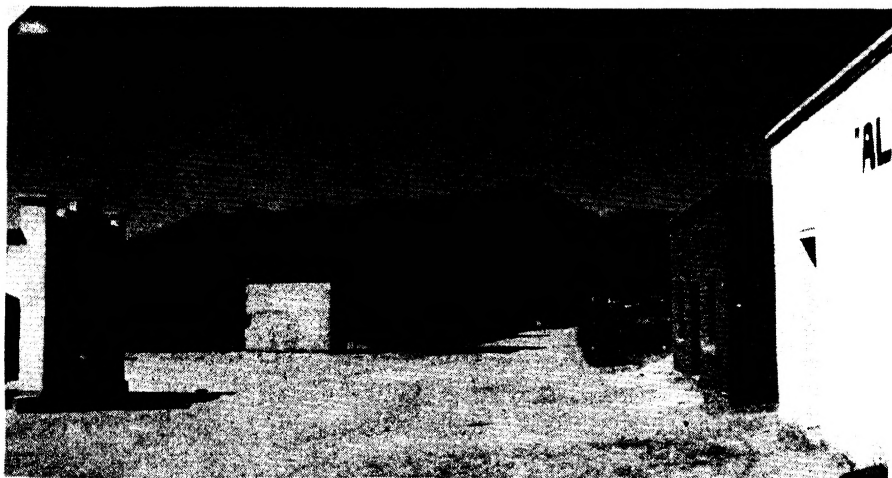


FIG. 2. View northward from the Sonoyta townsite, showing houses at the edge of town, fields, and the Sierra de Sonoyta in the background. The river bed is just beyond the more distant trees.

The Sonoyta townsite occupies a large constructional flat, composed of recent alluvium, with excellent subdrainage. This flat is gradually thickening, growth since man came to the area being in excess of 30 feet, as is indicated by the depth at which some artifacts are found. General relation of agricultural areas to mountains at the Sonoyta townsite is shown in Fig. 2.

### CLIMATE

The climate of the Sonoyta area is remarkably like that of Phoenix, Arizona, with about the same magnitude and distribution of both temperature and rainfall. Mean annual temperature is

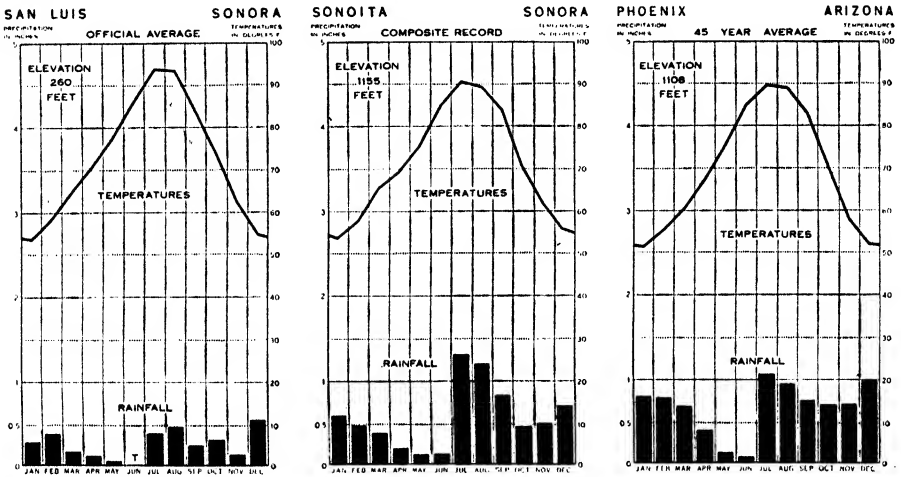


FIG. 3. Climatic charts for San Luis and Sonoita, Sonora; and Phoenix, Arizona.

about 71.6° F.; mean annual rainfall is close to 6.57 inches. Freezing weather and snow are almost unknown in Sonoyta: the hot summer weather is tempered by great diurnal temperature ranges, fairly steady gentle breezes, and moderate relative humidity. Sonoyta is definitely not a summer resort, but summer heat there is not only not intolerable, but is less than that at San Luis, on the Colorado River, or at Yuma, Arizona, a populous settlement at the junction of the Gila and Colorado Rivers (Fig. 1).

Temperature at Sonoyta is quite constant from year to year, the mean temperature variability being only two or three degrees (F.). In contrast, but like many other locations in the southwestern United States and northwestern Mexico, rainfall is extremely variable from year to year in both magnitude and distribution.

A dual rainfall regime is commonly noted in the Sonoyta area. During the winter, there are frequent light showers, an inland manifestation of the "Mediterranean" rainfall regime of the Pacific Coast area. During the summer, particularly the late summer, there are usually several violent rain squalls, caused by precipitation from northward-moving tropical air, uplifted by weak fronts or by passage over terrain, as well as by convection. The summer rainfall regime is very weakly monsoonal.

Complicating the climatic picture are occasional tropical hurricanes, which travel northward up the Gulf of California from the vicinity of the Gulf of Darien, where they apparently originate; and then sweep inland where the Gulf narrows, and "northers," which are outbreaks of very cold air from the Great Basin and Rocky Mountain region, usually occurring during the winter. Climatic summaries for Sonoyta and two other typical desert stations comprise Fig. 3.<sup>2</sup>

#### WATER SUPPLY

Because of scanty rainfall, agricultural settlements in the American southwest and the Mexican northwest are entirely dependent on irrigation, and all major townsites, with the exception of a very few mining communities, where the value of the ore is sufficient to justify a long water haul, are found at locations where water supply conditions are comparatively favorable.

The present water supply of the Sonoyta Oasis results from the effective use of a large natural porosity reservoir. Much of the rainfall upon the Sonoyta watershed, east of the Sierra de Cubabi, soaks into the ground, saturating a bed of coarse porous alluvium having an areal extent of more than 1,000 square miles. A part of this water rises in the soil by capillarity, and is lost by evaporation. The remaining water can escape from the buried porosity reservoir (a geological sponge) only by flowing outward thru the deep rock-floored channel of the Sonoyta River where it crosses the northeastern outliers of the Sierra de Cubabi. At this point, in prehistoric times, and at present, inhabitants of the Sonoyta Oasis divert the runoff from the river channel into the ditch system by means of a small dam, and conduct the water, by various distributary ditches, to their fields and to the townsite.

<sup>2</sup> Climatic data here presented were obtained from the Servicio Meteorologico Mexicano, the U. S. Weather Bureau, the Desert Botanical Laboratory, and field measurements.

Constant systematic maintenance and cleaning keep the quantity and quality of the water close to maximum attainable. Analysis of water from the ditch in the center of Sonoyta shows that the bacterial content of the water is quite low, and supports the Comisario's statement that "we keep the ditch as clean as possible."

Within the last fifteen years, a number of wells have been dug near the town to supply additional water in dry years. This water,

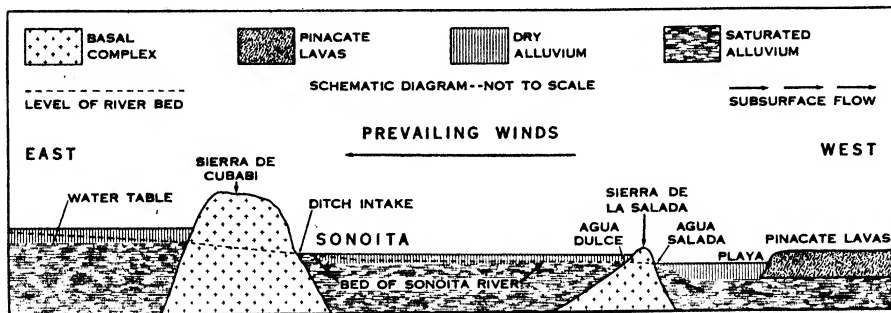


FIG. 4. Geological section of the Sonoyta Valley, showing relation of pervious and impervious strata, and position of water table.

which is cooler than ditch water, and has a slightly lower bacterial content, contains considerable alkali and fluorine.

A similar geological situation exists about fifteen miles west of the Sonoyta townsite, at Agua Dulce, the last source of potable water east of the Pinacate lava flows. Beyond this point, the subsurface flow is apparently thru buried channels under the lava; water of about the same chemical content appearing in surface and submarine springs along the Sonoran shore of the Gulf of California. Both geological and ichthyological evidence suggest that the Sonoyta River once flowed almost due west, and was diverted, west of Agua Dulce, by the great outpourings of lava from Pinacate Volcano. The southward-trending surface channel of the present Sonoyta River, below Agua Dulce, is dry except during the occasional floods.

Geological conditions making possible continuous irrigation at Sonoyta are outlined in Fig. 4. Because of the great size of the porosity reservoir, the outflow east of Sonoyta is substantially constant, so that crop failures due to water shortage are uncommon. After a series of dry years, the flow may become very scanty, but there is no record that the supply has ever failed completely.

### POPULATION

Population of Sonoyta at present is about 800, of whom most are permanent or long-time residents. There is some seasonal variation, because operators of outlying mines and ranches may spend part of the year in Sonoyta, and the remainder in the field.

Original inhabitants of the Sonoyta Oasis were Papago Indians, who developed irrigation agriculture in the region more than 1,000 years ago. After the establishment of the San Marzelo Mission, in 1698, cattle raising was introduced, raising the supporting power of the environment. Settlement of the area by Spanish pioneers began about 1700. Today, in the Sonoyta area, inhabitants having various mixtures of Indian and Spanish blood can be found, with a few who are apparently pure Spanish, and more who are probably pure Indian. Because both parent stocks were sound, and there is no racial prejudice, the resultant Spanish-Indian mixture is a thoroly normal and healthy human. In fact, in at least some instances, it appears that the mestizo is better adapted to the environment than either the Indian or the Spaniard, in part, perhaps, because of "hybrid vigor."

Despite a somewhat difficult environment, the unavoidable hazards of living under pioneer conditions, and lack of medical attention, the people of Sonoyta are not only healthy but long-lived. Notable also is the maintenance of physical and mental vigor to a great age.

### ECONOMIC ACTIVITIES

All activities in Sonoyta depend, directly or indirectly, upon agriculture. In consequence, farming is the principal activity, and nearly all of the permanent residents engage in some form of farm activity.

Principal crops are corn, melons, squash, and beans; minor crops, produced largely for home consumption, include a wide variety of greens, various types of peppers, carrots, onions, and other "kitchen garden" crops. Area in crop, in most years, is about two square miles, the exact area depending upon the water supply, market conditions, and availability of seed and labor.

Cattle-raising is a secondary industry in the area, and produces not only enough beef for local use, but usually a surplus for sale. Cattle are raised in those parts of the oasis that are not suitable for irrigation, but which have some vegetation. Sheep, goats, pigs,



FIG. 5. Crossing the Sonoyta ford during a low-water period in the rainy season. At its highest, the river submerges the river banks in the background. Vehicles on the far bank are waiting their turn to be towed across.

and chickens are raised for local use, but not for market.

Processing of the medium to low grade metallic ores found in pockets in the mountains near Sonoyta furnishes a slack-season occupation for some of the inhabitants. Altho the mineral wealth of Sonora is great, it is unfortunately distributed, most of the ores being too far from water and present day transportation to permit profitable mining. Occasional pockets of high-grade ore, however, are so rich that they can be worked, and the proceeds from the sale of a few tons of high-grade may be sufficient to pay not only for mining, hand-picking, back-packing to the end of the road, haulage to water, concentration, freight to smelter and customs duties, but also to pay a gratifying profit. Those who make money from this type of mining really earn it.

Because of distance to markets, and distance to the railroad, the transportation industry is important to Sonoyta. Many fami-

lies own one or more motor vehicles, which permit hauling surplus crops to market, and importation of manufactured goods. Heavy freighting is done by commercial truckers who, given the proper fee, can "go to Hell and bring the Devil back." Freighting between points in the United States and Sonoyta is made somewhat difficult because of the ford of the Sonoyta River, just north of town. During the dry season, the crossing is just difficult, a new roadway being dug each year. During the wetter parts of the summer rainy season, the river rises as much as 30 feet, and the town is inaccessible from the north for several days at a time. Before the waters rise too high, and when the floods are declining, vehicles are hauled across the flooded roadway by use of a long cable and a tractor on dry land, as in Fig. 5. Construction of a bridge at this site would cost more than the assessed valuation of all of Sonoyta's buildings.

Recent construction of a military road from Sonoyta to the rail-head and roadstead of Puerto Peñasco, on the Gulf of Cali-



FIG. 6. A Mexicali stage in front of the Immigration Office in Sonoyta during a lunch stop for the passengers. Note the extra tanks for water and gas. It is about 125 miles in either direction from Sonoyta to the next gas station along the border. Quality of service should not be judged by the appearance of the vehicles. The service is quite good, and the drivers are expert mechanics, able to repair almost any type of breakdown en route.

fornia, has more than doubled truck traffic thru Sonoyta, so that the town has become a refueling point and rest stop for drivers who haul fish from the Gulf to markets in the United States. Many of the fish trucks, instead of returning empty to Puerto Peñasco, bring loads of ice, groceries, or lumber to Sonoyta and other points en route, making their haul both ways profitable, in some instances.

Passenger traffic east and west thru Sonoyta is quite heavy, the settlement being the last inhabited place before the Colorado River is reached. The trail from Sonoyta to the Colorado River, one of the most barren stretches of road in North America, is locally known as the *Camino del Diablo*. One of the stages that travel this perilous highway is shown in Fig. 6.

Service industries in Sonoyta include two stores, four or five restaurants, a filling station, and a small ore mill (west of town). Because all members of a family commonly live together, and share the work of the household and farm, few servants are needed in Sonoyta, and all members of a family, from the very young children to the great-grandparents, have definite places in the family economy.

Professional workers include the customs and border patrol officers, the postmaster-radio operator, the school teacher and the *comisario*. There is no resident physician and no resident priest. Many of the residents are skilled in first aid and elementary diagnosis, so that most simple ailments are treated locally. The seriously ill are taken to Ajo (Arizona) or Caborca (Sonora) for treatment. Medical advice, in an emergency, is obtained by radio, and medicines are delivered promptly and gratis by truckers or by members of the border patrol.

#### POLITICAL AND SOCIAL LIFE

Government of Sonoyta is largely vested in the *Comisario*, an elected official with wide discretionary powers, whose duties include those of sheriff and mayor in most villages in the United States. By custom, the *comisario* cannot succeed himself. Because the work is difficult, the responsibilities heavy, and the pay low, most Mexicans regard the office as a civic duty, to be performed once well, and then relinquished. The *comisario* is usually a man of great ability, who combines the character traits of a frontier peace officer with those of a working diplomat. For more than two decades, the people of Sonoyta have elected competent *comisarios*,

so that the present city administration runs very smoothly, with strong popular support and cooperation. The *comisario* appoints such deputies as he needs, and these men perform their duties with great skill and diligence.

Because Sonoyta is an orderly town, with a well-integrated population, no extensive court system has been found necessary. Minor misdemeanors are judged by the *comisario*, who guides his verdicts by the recent new Mexican legal code. There is a small jail in Sonoyta (the "juzgado civil"), which is usually vacant, or has a short-term occupant who is sleeping off a too energetic celebration. Most civil cases are settled by the local judge, who functions chiefly as an arbiter. For more than four decades, most civil disputes in the Sonoyta area have been settled by Judge Traino Quiroz, who is known thruout Sonora for his fairness and good sense. Serious criminal and civil cases are tried in Caborca, the district administrative center.

Education in Sonoyta is in charge of the school teacher, who conducts a one-room Federal school, poorly equipped by United States standards, but effective in combating illiteracy. Because most of the teachers work with an almost fanatical zeal, and the average Sonoran of today wants to learn, the amount of education obtained per Peso spent is surprisingly large. Because of a mixed linguistic environment, many residents of Sonoyta speak Spanish and English with equal facility, and a few are also proficient in Papago, or other Indian languages. It is customary, in many parts of Sonora, to speak to each person in his own language, a most helpful courtesy, which results in great understanding, provided the speaker is truly competent in all languages used.

Because of the noonday heat, the working day commonly begins at sunrise, and continues until about noon. From lunch time until mid-afternoon, most of the people rest, or work indoors; and then, as it becomes cooler, the remainder of the day's work is completed. The "siesta," which is seldom spent in sleeping, is a physical necessity, not just an excuse not to work (Fig. 7).

Social activities in Sonoyta are largely family affairs. There is no theater, woman's club, or bowling alley, and little need for any of these. Despite the absence of these "essential" recreations, however, there is no lack of recreation. As in pioneer communities in the United States, everyone who is able takes part in the building of a new house, helps with repair work, and lends a hand in

getting loaded trucks across the river bed when the water is high.

Visiting among the women, who customarily do not do the harder work in the fields, is frequent; and in such gatherings there is the customary amount of gossip. Notable by its absence, however, is the vicious meddling in the affairs of others that is common in some small communities in the United States.

Fiestas, to celebrate important national holidays and some religious holidays, are participated in by most of the population. It



FIG. 7. Resting in the shade during the early afternoon heat. It is customary in Sonoyta, during the summer, to do most of the hard work of the day between dawn and noon, and then to rest during the hottest part of the day. Remaining work is done in late afternoon and early evening. Note the brilliant sunlight in the foreground.

is notable, during such celebrations, that the people are very democratic, friendly, and orderly: a condition in marked contrast to large assemblages in the United States.

Occurring at almost weekly intervals, alternately at Ajo and Sonoyta thruout the spring, summer, and early fall, are the baseball games between town teams. These, widely attended and energetically played, are as interesting as any big-league games. Interest is great, because all of the players are known to most of the spectators, who take personal pride in the achievements of their team. During the drier parts of the year, the umpire wishes for X-ray eyes, to see thru the dust.

Most of the inhabitants of Sonoyta are nominally Roman Catholic; all follow Christian rules of behavior and ethics. The courtesy of Old Spain is followed in most social contacts, altho, in the field, the similar customs of the Papago Indians may be used. As both types of social usage are suited to the environment, there

are few misunderstandings. A few of the younger residents of Sonoyta have learned bad manners from American tourists, and are sharply reprovved therefor by their elders.

Life in Sonoyta commonly proceeds in a quiet and orderly fashion, with little friction or disturbance, but also with few idle moments. The major part of each day is necessarily devoted to work, much of it hard. In Sonoyta, the eight hour day and the forty hour week are unheard of. To make a satisfactory living, it is necessary to work each day until the necessary work is done, and that usually takes twelve hours!

#### FUTURE OUTLOOK

For the first 1,000 years or more of its history, the Sonoyta Oasis was an almost completely isolated Indian Camp, and was, in consequence, almost entirely self-sufficient. After the establishment of the San Marzelo Mission, by Eusebio Kino, in 1698, some regular outside contacts were established, but virtual self-sufficiency was maintained until about 1920.

In recent years, with transportation improvements, Sonoyta has tended to become a supply and transfer point, with increasing trade and travel. Today, with the virtual completion of the Sonoran Railroad, the paving of the military highway from Ajo (Arizona) to Puerto Peñasco (Sonora), the finding of water at usable depths in several adjacent desert areas, and increasing prices for corn in world markets, it appears that Sonoyta, while maintaining its agricultural production, will become an increasingly important transfer and trade point.

Altho some competition to Sonoyta businesses is furnished by the recent construction of a small town about a well at Dowling, on the border, about two miles north of Sonoyta, the increase in trade and travel is such that there is enough business for all. Travel to the Organ Pipe Cactus National Monument, in Arizona, not far from Sonoyta; and revival of the search for minerals in Sonora; all tend to bring increasing business to Sonoyta merchants, and to increase the demand for local foodstuffs.

These changes are enough to upset the culture and economy of many small communities, but it appears that Sonoyta, if changed at all, will be changed for the better. The inhabitants are inherently healthy, industrious, psychologically stable, and extremely adaptable. Desert people must be. Their motivations are sound—they are determined to give their children a better start in life than they

had; and are willing to work very hard to accomplish that end. Altho three languages are spoken in the area, and three cultures merge there, the similarities in the cultures are more numerous than the differences, so that friendly contacts and sound business relations are, and can continue to be, maintained. Language differences vanish when almost the entire population is bilingual, as is the case in most of the Arizona-Sonora borderland.

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## SOME PRINCIPLES AND LAWS OF ECONOMIC GEOGRAPHY

GEORGE T. RENNER

Teachers College, Columbia University

### DEVELOPMENT OF ECONOMIC GEOGRAPHY

Economic geography, or *geonomics* as it is sometimes called, obtained its start during the latter part of the eighteenth century when Immanuel Kant in Germany pointed out the existence of a field of geography which he termed "Mercantile Geography." At about that same time, Adam Smith in England was publishing his *Wealth of Nations*.<sup>1</sup>

From that time on, economics grew vigorously, but economic geography was relatively neglected for nearly a century. Then, beginning with George G. Chisholm in Britain<sup>2</sup> and J. Russell Smith in the United States,<sup>3</sup> economic geography developed rapidly. Today, in America at least, it is the dominant aspect of geography.

### DESCRIPTIVE AND FACTUAL STUDIES

During the past four decades, a wide variety of specific studies, as well as a considerable number of textbooks and other general

<sup>1</sup> By some students, this is considered to mark the real beginning of modern economics. Others would set that point a decade earlier with the publication of A. R. J. Turgot's *Reflexions sur la formation et la distribution des richesses*, or even still earlier with the beginning of the physiocratic school of thought.

<sup>2</sup> *Handbook of Commercial Geography*, 1889.

<sup>3</sup> *Industrial and Commercial Geography*, 1913.

works on economic geography, have appeared. Today, altho there is in existence a large volume of geonomic literature, the works composing this literature consist predominantly of either description or exposition, and they generally lack any clear statement of theory and principle. Indeed, some economic geographers appear to have regarded their field as lacking in basic principles and laws, implying that altho economics exhibits many valid generalizations, economic geography is, per se, largely descriptive and factual. This implication is probably the result of the relative immaturity of the latter subject.

### GENERALIZATIONS

Economic geography has, however, evolved to the point where at least a tentative statement of its basic generalizations can be made. Some of these are principles or underlying tendencies which would seem to be valid under all conditions. Some of them, however, are laws<sup>4</sup> which would seem either to operate quantitatively or to involve cause-and-effect relations under specific conditions within the framework of one or another of these principles.

At the outset, it should be noted that there are four basic principles, as follows:

The Principle of Geonomic Relationship

The Principle of Optimum Location

The Principle of Regional Specialization

The Principle of Geonomic Succession

In the paragraphs which follow, each of these is discussed, together with the several laws which would appear to operate under each.

### THE PRINCIPLE OF GEONOMIC RELATIONSHIP

It is a truism that the two considerations in economic geography are man and his technology on the one hand and the natural elements (i.e. the natural forces, processes, and resources) on the other hand. These latter combine in an endless variety of ways to create the natural environment which everywhere constitutes both a foundation for and a limitation upon human society—offering encouragement here, hindrance there. To the quality and peculiar character of this natural environment, man locally and regionally adapts his patterns of industries, economic constructions, and business institutions. Out of this fact, arises the most fundamental

<sup>4</sup>In so far as any social science can be said to possess laws or centralizing tendencies.

phenomenon in economic geography, namely *geonomic relationship*.

Industries, that is productive economic activities, are the foundation of human society. Mankind is able to exist only because it has learned to produce economic goods via these industries. Production is, however, only a more or less complicated process in which man uses the natural environment to obtain the necessities of life. Each different kind of industry, therefore, represents man's establishing relations to specific natural processes and resources selected from the natural environment. Thus, all of man's occupations and economic institutions have arisen out of human adjustments to Nature.

These, however, do not arise arbitrarily or haphazardly, but instead tend to follow the general Principle of Geonomic Relationship, as follows:

Every industry represents the capitalization by man of some element or combination of elements in the natural environment. The choice of industry and the success with which it is prosecuted depends upon the quality of the local resources balanced against the level and effectiveness of the available technology.

### *The Law of Primacy in Resource Use*

Economic production is not a simple matter of establishing indiscriminate use relations between man and natural resources. The value of the latter are highly variable. Consequently, what lands are brought under cultivation, what pieces of forest are cut, or what mineral deposits are mined is decided by a very complicated process of choosing and rejecting by man.

Any natural resource possesses value because of two qualities, richness and location. The amount of really rich grades of any natural resource is decidedly limited, a circumstance which is reflected in the order in which man selects the various grades of it for utilization. Indeed, this may be stated formally as the so-called Law of Maximum Productivity or the Law of Primacy in Resource Use. This is as follows:

In all primitive economies, and in present day local economies not yet fully invaded by modern means of transportation, those resources possessing the greatest richness of fertility tend to be exploited first.

### *The Law of Accessibility*

Improvements in transportation have, however, caused the rapid spread of competitive exchange economy. Under the stress of such an economy, the spread of a power-and-machine technology has also

been rapid. Improved transportation has made available many natural resources which were formerly inaccessible, but it has also made available fertilizer, selective breeding, more efficient smelting, improved marketing and all such forms of capital, also. Under their onslaught, the Law of Primacy in Resources Use is being weakened and what might be called the Law of Accessibility is tending to supplant it. This is:

Under an exchange economy, lower-grade resources, if readily accessible to a large market can be utilized profitably, while richer grades of resources, less accessible, remain unexploited.

### THE PRINCIPLE OF OPTIMUM LOCATION

Quite apart from the question of the selective exploitation of natural resources is the problem of what localizes industries and, in many instances, locates them on specific sites. Every industry (productive economic activity) requires for its prosecution some six ingredients or component elements: capital, labor, market, power, raw materials, and transportation. Obviously, it is an advantage for the industry to be as near to these as possible.

This advantage is expressed in the Principle of Optimum Location.

Any industry tends to locate upon a site which provides optimum access to its ingredient elements. If all these elements occur close together, the location of the industry is pre-determined. If, however, they occur widely separated, the industry will be so placed as to be most accessible to that element which would be most expensive or most difficult to transport, and which becomes, therefore, the locative factor for the industry in question.

### *The Law of Location for Extractive Industries*

There are in general four great classes of industry, of which the extractive class is geonomically the simplest. The law governing the localization of such activities is as follows:

The extractive industries are, and must continue to be located by the occurrence of their raw materials.

As a corollary, it may be said that in connection with most industries of this kind, the Law of Accessibility dictates that raw materials nearer to market will be exploited before those lying farther away, and that large areas of forest, grassland, and wild game shelter will be destroyed and replaced by more productive land uses.

### *The Law of Location for Reproductive Industries*

Agricultural and other reproductive industries fall into two groups, those which produce staples, and those which produce perishable commodities. The law governing their localization is:

Reproductive industries which produce staple commodities are localized by raw-material factors, i.e. by nature-made conditions operating under the Law of Comparative Advantage.<sup>5</sup> Those which produce perishable commodities tend to locate close to their markets even under the handicap of increased costs.

### *The Law of Location for Facilitative Industries*

The facilitative industries include transporting, financing, and the "services." Their localization may be expressed in the following terms:

The facilitative industries tend to be located almost entirely by the distribution of markets for their services or utilities.

### *The Law of Location for Manufactural Industry*

The law governing the localization of the fabricative activities is most complex of all. Briefly it may be stated as follows:

Any manufactural industry tends to locate at a point which provides optimum access to its ingredient elements. It will, therefore, seek a site near to—

- (a) *raw materials*, if it uses perishable or highly condensable raw substances,
- (b) *market*, where the processing adds fragility, perishability, weight, or bulk to the raw materials, or where its products are subject to rapid changes in style, design or technological character, or
- (c) *power*, where mechanical energy costs of processing are the chief item in the total cost of fabrication, or
- (d) *labor*, where the wages paid to skilled artisans are a large item in the total cost of fabrication.

To this, one might add that *capital* and *labor of management* are locative only during industrial youth of a region, and *transportation* facilities are locative only during economic old age of a region—and then only for miscellaneous industries.

### THE PRINCIPLE OF REGIONAL SPECIALIZATION

The elements of the natural environment are not evenly distributed over the earth's surface. In different sections, they are arranged in very different combinations. This means that the earth's surface and even the surface of a country such as the

<sup>5</sup> This law is discussed later in this paper. The Law of Comparative Advantage can be transgressed to a degree depending upon the amount of tariff protection provided by political action.

United States is a mosaic of unlike natural regions. Since these regions differ, man must perforce follow different patterns in adjusting his living to the natural environment in these unlike regions. Eventually, the patterns of human construction and business which he establishes, differ markedly from one region to another. As a result of this process of differentiation, economic activity in one region is often quite different from that in other regions.

This may be expressed in the following generalization:

As commercial competition increases, any region will, unless prevented from doing so by political controls, tend to specialize in the production of those commodities for which it possesses a natural or technological advantage.

### *The Law of Comparative Advantage*

The development of means for transporting products widely, together with the creation of a fairly constant market for a great variety of commodities, has largely destroyed the need for regional self-sufficiency. If a region can produce on a large scale, one item for which there is a general demand over the earth, and if it can get that item to market, it can with the resulting income, purchase everything else which it needs. There is, then, a general tendency among all advanced regions to move increasingly toward an economy of specialization. Each region tends in the direction of producing one or several commodities for which it possesses natural or technological aptitudes. This process of regional specialization tends to obey what has been called the Law of Comparative Advantage:

Wherever there are several alternative uses for land or other natural resources, that use which is most advantageous or productive will be selected.

### *The Four Laws of Trade*

It is obvious that the further the Principle of Regional Specialization is extended, the greater will be the necessity for specialized regions to increase their trade with one another. Trade is not haphazard nor whimsical, however, but tends to obey the following four laws of trade.

#### *First Law of Trade (Law of Trade Origin).*

Trade is created by the existence of surpluses of different commodities. Differences in commodities are, in turn occasioned by

- (a) differences in culture,
- (b) differences in natural resources, and
- (c) differences in the geonomic stage of development.

The greater are the differences in commodities, the more impelling the inducement to trade.

*Second Law of Trade (Law of Trade Change)*

As population increases and economic development progresses, geonomic readjustments are made within a region, and the character of the commodities which are exported changes.

*Third Law of Trade (Law of Trade Direction)*

As commercial relations are extended, trade based upon cultural and economic-geographic differences tends to decline whereas trade resting upon resource differences tends to become accentuated. Consequently, predominantly east-west flows of trade tend to become predominantly north-south flows.

*Fourth Law of Trade (Law of Trade Volume)*

The volume of commerce moving over any trade route varies directly with the size of the surpluses of goods and inversely with the physical barriers and the political restrictions.

*The Principle of Geonomic Succession*

The end result of the operation of the Law of Comparative Advantage is to produce what has often been termed the *geographical division of labor*. This has already progressed to where a large amount of regional specialization has occurred and a huge growth of trade has followed.

Any geographical division of labor is, however, a very fragile arrangement and is very susceptible to change. Indeed, it is a general truth that the economic value of any particular area is subject to change in response to population increase, technological advancement, or the discovery or depletion of natural resources.

When the population of a tribe of primitive food gatherers increases to a point where hunting cannot provide an adequate food supply, the more resourceful members of the tribe will capture wild animals, breed them in captivity, and establish ownership over water holes and range grass. Eventually, the tribe shifts its geographic relations from the biota, to water holes and grassland thru the medium of domesticated animals. If human numbers continue to increase, another geonomic readjustment will be made. This time, relations to soil, climate, and landforms may be established and an agricultural adjustment made. This kind of adjustment and readjustment has been made often enough in history to suggest the operation of an underlying principle. It is often referred to as the Principle of Geonomic Succession.

Stated as briefly as possible this is:

As population increases, any human society tends to shift its geonomic dependence from one set of environmental elements to a more productive set of elements.

Conversely, where population decreases, human society tends to shift its geonomic dependence to a less productive set of elements.

### *The Malthusian Law*

The population of any country, region or locality is the most important factor in the economic life of that area. Moreover, because population has a tendency to grow in numbers, it tends also to exert an increasing pressure upon the natural resources of the area which it inhabits. The ratio of human numbers to the quantity of resources at man's disposal, or as it is usually called, the man-land ratio, has long been the subject of widespread interest.

The law governing the man-land ratio, i.e. the Law of Biostatic Pressure, or as it is more often called, the Malthusian Law reveals that:

Human numbers tend to increase by geometrical progression whereas the means of subsistence tend to increase by arithmetical progression; and therefore the population (unless checked voluntarily) will outrun the food supply to the point where further increase will be prevented by malnutrition, starvation, or pestilence.

### *The Law of Diminishing Returns*

Even without the profound effects of major inventions or of resource discoveries and depletions, the weight of swelling numbers within an area is sufficient to compel a more intensive exploitation of those resources which the inhabitants are utilizing for their support. This involves additional applications of labor and capital to the resources in question.

For each successive application of labor or capital, an enhanced production of goods is obtained. The increase in production, however, after a time gets smaller and smaller until finally a point is reached where the increase is worth less than the additional labor or capital applied. From that point on, more production can be obtained, but only at the expense of a net loss. Stated formally, this Law of Diminishing Returns is:

There is a point in the application of labor and capital to the exploitation of natural resources, beyond which further application yields less than a proportionate increase in production.

### CONCLUSION

The seventeen principles and laws which have been discussed in the foregoing pages, are admittedly an incomplete list of the generalizations of economic geography. Two of them, the Malthusian Law and the Law of Diminishing Returns, are already well known from economic literature. Most of the remaining fifteen have appeared in one form or another, either explicitly or by implication, in the literature of geonomics. The writer has here

attempted to formulate some of them and to restate and amplify others. A very large amount of additional mental labor on the part of many geographers will be necessary before all of the geonomic principles and laws can be formulated and stated in final form.

Meanwhile, this tentative statement of the simpler generalizations should prove valuable to teachers by providing them with the means for directing and sharpening their teaching of economic geography.

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## WORLD PATTERNS IN HIGH SCHOOL GEOGRAPHY\*

ZOE A. THRALLS

University of Pittsburgh

As yet geography is not a usual subject in the high school curriculum altho interest in high school geography has been steadily increasing. Far too many of our school administrators and curriculum makers still think that all necessary geographic knowledge and skills can be taught in the first six grades. This attitude continues in spite of the lessons learned thru bitter experience during the last war. The increased interest in geography in both junior and senior high school is due primarily to the interest of the public and to public pressure. Consequently, curriculum committees are asking, "What geography should be taught in the high school?"

In this paper I am not proposing a complete high school geography program. I am discussing only some geographic world patterns which should be developed as a "world frame of reference" during the six years of high school.

### WHY WORLD PATTERNS IN THE HIGH SCHOOL?

Today we must think in global terms. The interrelations of the world community are recognized even by the man in the street. However, the concept of the interdependence of the lands and peoples of the world is not fully understood even tho the phrase has become commonplace. It has not become sufficiently meaningful as to change peoples' thinking and their attitudes. Consequently, people are constantly expressing one viewpoint but acting upon a

\* Presented at the Cleveland meeting of the National Council of Geography Teachers, November, 1949.

completely opposite view. The fact behind such inconsistency in word and action is due, in part, to the lack of any basic world patterns with which to think. The majority of people cannot think clearly even in terms of simple location, let alone in terms of the significance of location or the interrelationships of location. They lack any world frame of reference. This lack is found in all levels of society from the statesman to the ranks of the ordinary citizen. Since man today is living and working in a world environment he needs sufficient knowledge of the world to overcome this inconsistency of word and action. This knowledge of the world must be organized and not a mass of isolated facts. It must be in the form of world patterns which he can use constantly in his daily life. Due to modern means of transportation and communication man is less dependent and consequently less limited by his local environment, but he has become not only more dependent upon the conditions in the whole world but also is subject more to world limitations. Man has acquired not only great opportunities but also has greater responsibilities and a new type of limitation.

In part as a result of having to adjust to a global environment, the average individual has developed a feeling of insecurity and frustration. He cannot see his place in the world. If he learns to visualize and understand a few of the basic world patterns, then he will gradually gain a feeling of greater security, of at-homeness in the world.

#### WHAT ARE SOME WORLD PATTERNS?

There are nature-made world patterns and man-made world patterns. The nature-made patterns have given unity to the earth since the beginning of time. Some of the nature-made patterns are:

1. The continents and the oceans with their circulation systems;
2. The world climatic pattern which was recognized by the early geographers as giving unity to the earth;
3. The world vegetation pattern;
4. The world pattern of natural resources;
5. The world soil pattern and others.

Some man-made patterns thru which man has given unity to the world are:

1. Distribution of population;
2. World pattern of occupation tied together by world pattern of trade, transportation, and communication;
3. World political pattern.

Three of these world patterns are so basic as frames of reference today that every high school student should be given the opportunity to acquire them. In the process of developing the three basic world patterns others are used until they also become a part of the mental equipment of the student. The three basic world patterns are: the climatic pattern; the world occupation or the industry and trade pattern; and the world political pattern.

### WORLD CLIMATIC PATTERN

The world climatic pattern is basic because the man-made patterns and also some of the nature-made patterns are so closely related to it. Furthermore it reveals one way in which the world functions as a physical unit. The arrangement or pattern of world climatic regions is not an accident or the result of mere chance. The location and the characteristics of the various climatic regions are the result of the interaction of a number of scientific laws and principles. As the student studies the climatic regions of the world, he becomes aware of their orderly arrangement and gains an initial understanding of their location and characteristics and how man has adjusted to the world climates.

In developing and giving meaning to the world climatic pattern, the distribution of people on the earth is studied and certain relationships between population density and the physical environment should be noted. Maps of distribution of land and water forms, the ocean currents, distribution of rainfall and of world wind belts and other world patterns are used. As man's ways of living and the characteristics of these climates are studied, the interrelations of the various world patterns, both human and physical, are noted. Thus, thru use, these world patterns become a part of the student's mental equipment.

### WORLD PATTERN OF INDUSTRY AND TRADE

The pattern of man's occupations or the pattern of world industry and trade is another world pattern of great functional value, if properly taught. Industry, whether farming, dairying, manufacturing or any other, is global today. The cattle rancher of Argentina, the African farmer gathering oil palm nuts or raising peanuts—each one feels the effects of the chaotic condition of world trade since 1945. The mining industry responds almost overnight to the discovery of new mineral deposits or the exhaustion of a valuable ore body. The interdependence of all manufacturing

is so well known that it is commonplace. The trouble spot, tho, is that the majority of the ties which bind industry and trade are so complex and hidden that the average person is unaware of them. His ignorance results in a feeling of frustration when his means of livelihood is upset as a result of events in some distant part of the world. The farmer understands drought, tornadoes, or floods, which strike directly, but he does not understand what has happened when, for instance, Brazil and other countries become exporters of cotton and the price of cotton declines.

A miner sees the exhaustion of a mineral deposit and understands the direct result, but he does not understand the closing of a mine when it comes as a result of the discovery of a richer or more easily mined deposit in a distant place.

The complex ties which bind almost any manufacturing industry to mining, agriculture and other industries in many parts of the world are difficult to see and understand. Not all such ties can be traced but those of a few basic industries should be developed.

From a course in economic geography the high school student should become acquainted with such world patterns as:

1. population distribution;
2. basic occupation pattern;
3. natural resources—forests, minerals, etc.;
4. transportation—communication (ocean, land, and air).

He should gain a realization that his work, no matter what it is, is dependent upon other peoples' work and conditions in many other parts of the world. In other words, he is a part of the world economy. Industry is on a world wide basis today. Consequently, the worker must have some understanding of these global patterns.

#### WORLD POLITICAL PATTERN

An understanding of the world political pattern is of great importance today because governments are taking such an active part in industry, trade and transportation. The kind of government a nation has affects directly the economic life of the nation. Also as time-distance has shrunk, nations are drawn closer together and the danger of misunderstandings and so-called "incidents" leading to war are more likely to occur. Ties of race and nationality are world wide as national groups have spread over the world, complicating political conditions in many countries. People of a nation are more critical of others than formerly. Criticisms sweep around the world via radio and newspapers—some of these criti-

cisms are unthinking, some due to ignorance, some are deliberate. Nations respond quickly as their national pride is hurt. If greater coopération among nations is attained, it must be based on a sympathetic understanding of and appreciation of the problems, ideals and traditions of others. Prejudice and narrowness must be overcome. These can be overcome, altho the task is slow and difficult. A well-taught course in the geography of nations is *one* means of accomplishing this task. In such a course the geographic foundations of a nation should be studied, and the effects of the natural environment—size, location, climate, mineral resources, etc., upon the development of the national pattern of the nation, also the people, the distribution of people, of industry and other man-made patterns, and finally how the nation fits into the world political pattern.

The development of these world patterns must be kept on the high school level. They can be of sufficient depth as to give the high school student an understanding of the modern world and provide him with a "frame of reference." Of course, these patterns must be taught as dynamic patterns. But the student must gain a realization that today we live in a completely occupied world. Consequently, our geographic orientation and outlook must be world wide—our world includes the whole earth. We must develop in the high school student an awareness that the whole earth is now one indivisible if man and his culture are to survive.

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## ADVENTURE IN GEOGRAPHY IN SECOND GRADE

MAUDE VOUGH

Cuyahoga Falls, Ohio

We really did study Geography—all forty-two of us in the Second Grade. We began in a small way, but interests developed, one out of another, until we spent parts of the entire school term in such an enjoyable way that we intend to repeat it another year.

Only those characteristics of geography which could be adapted to second grade thinking were used. There were selected only those observations that might conceivably become a part of the pupil's foundation for future work in his geography classes, or those that might carry over into the next grade as on-going experiences. This study was really only a direct labeling of geograph-

ical terms, and facts, and causes, and effects, as related to our daily living in the school environment, with which environment, the children needed to be made familiar. However much we believe that the correct terms should always be used in their proper places, the word "geography" never even entered the picture.

In the first grade, experiences are so new that the average child's life is primarily composed of anything that happens in, or has to do with, his room and his group. By the time he enters second grade he begins to look farther afield. In our own situation we do considerable directing toward the end that a child may "see" what he looks at! Since we have extensive grounds and varied terrain we have excellent opportunity for an "Adventure in Geography." We make use of every contour of our sixteen acres, however small; for to the primary child all such assume significant proportions—as we ourselves can witness in re-visiting a childhood scene.

It is surprising just what teaching mediums the immediate environment has to offer. We have, for instance, a series of very small *gullies*. These were caused by *erosion* over a filled-in portion at the *western boundary* of the playground. Our *southern boundary* is the highway. *Extending* across the *eastern boundary* is a small *body of water* which must be a *lake* since it has no *outlet* nor obvious *inlet*, but is *located* on *low ground*, and while it almost disappears in very *dry weather*, it may possibly be fed by a *spring* or small *underground stream*,—or could it be the result of an arrangement of *rock strata*? We discuss this in detail.

Our *northern boundary* contributes a *hill* with a man-cut *bank* on one side and a gentle *slope* on the other. The bank provides a study in *soil*. Near this portion but *centrally* located, there is a natural *swampy* spot. Otherwise, the *surface* of the playground is *level*, with plenty of sweep for *winds* that may come from any *direction*. When we lie down on this grassy meadow we can imagine that we are on the *Great Plains*, about which we read in our second grade basic reader.

We learn that North, South, East and West are directions, and that directions are truly told by *compass*. Here, we are learning something that we will meet again toward the end of the year in "Neighbors on the Hill."

We learn that boundaries are fixed by *surveying*. In February, stories of George Washington recall this information. In connection with boundaries, maps of the United States had to be

introduced, as our blackboard sponge brought us into a discussion of Florida.

As we mentioned before, this study continued thruout the entire school year. We began it by *exploring* our own room. We drew *picture maps* of the room and later replaced the pictures with symbols. Our interest spread to other parts of the building, and naturally arrived at the roof, which was a study in itself. It is flat and covered with slag. It holds chimneys, ventilators, radio antennae, etc.

Since all of us could not go up on the roof, we chose two boys to represent us. We planned their *excursion* for them, asking them to report on the things that we ourselves might have expected to see. Our principal, Mr. Bankes, and our engineer, took the boys up. As Mr. Bankes knew the purpose of the visit he encouraged the boys to ask questions, and unobtrusively guided their interest. Upon their return we listened to their report, and asked many questions. The boys put a map of the roof as they remembered it, on the blackboard.

To supplement this, a moving-picture panorama of the countryside as seen from the roof was taken and shown in the classroom. We then visited each point of interest on the playground and drew maps of what we had seen. We re-visited the playground, compared, and then revised our maps where necessary.

As a final gesture, and because the flag on the front lawn inspired it, we made a ribbon recording along the line of good citizenship and played it back to our parents at a last-of-the-year party.

Altho this material, as given, was necessarily an individual study and of a local nature, it can be adapted to many teaching situations. As there is no place in the primary grades for Regional Geography as such, it naturally follows that a generous integration must needs be made with other phases of work at this level. However, pupils can be given definite teacher-directed activities that point toward geographic thinking. No attempt should be made in any way, to go beyond the second grade child's level of development.

Any science includes, among others, critical thinking and proper evaluation. Children need help in forming a philosophy that leads to a better understanding of others and since there are positive reasons for people being the way they are, how better can this be begun than by investigating the environment or contributing

factors that have such a direct relation to the characteristics of any given group?

Too much can not be said about giving children all the homely experiences possible; about beginning with what is at hand and leading on from there. There is immeasurable satisfaction in watching a child grow and in knowing that you have had a part in that development.

Society needs more mature adults. We can begin, by teaching children that they *must* learn to see and to think for themselves.

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## A STUDY IN GEOGRAPHY WORLD RELATIONS

JOHN R. SAHLI

State Teachers College

Indiana, Pennsylvania

There is considerable discussion today that much of the prejudice, fear, and hatred that exists between nations could be removed if the "Iron Curtain" of misunderstanding could be rent. Some people believe if newsmen, students, and travel accommodations could freely be exchanged between the Soviet Union and the United States that some of the causes for suspicion between these two great powers might be eliminated. As it is, we have scarcely finished one world-wide devastating conflict than indications point to another catastrophe, even more terrible in its implications to the future welfare of mankind.

Geography, which fortunately can be very human in its social implications, is an important means for developing tolerance and promoting understanding between peoples. Altho the ultimate object in teaching geography is to help in producing an enlightened citizenship; the immediate aim is to make people intelligent about lands and peoples of the earth and to implant an abiding interest that will reach beyond school days.<sup>1</sup>

In an attempt to apply the theory in the above geographical aim to actual classroom practice, a course in Travel Geography was instituted in the seventh grade classes just prior to World War II in the Beaver Falls Junior High School, where I was teaching.

<sup>1</sup> Wilcox, Lillian Alice, "An Analysis of Recent Trends in Geography in the Elementary School," unpublished master's thesis, Department of Geography, Cornell University, 1927, p. 1.

### PROCEDURES FOR SETTING UP THE COURSE

Such standard geography materials as textbooks, atlases, globes, maps, etc., were used as the bases for the course. However, the local community approach to the study of world problems was made in the beginning of the course. Railroad, bus, and airline time tables were studied, a skill often neglected in school, and distances and times involved in travelling to the west coast, the point of embarkation, were estimated. This procedure integrated the significance of mathematics in the understanding of geography. In addition, the significant contributions of the various regions thru which the imaginary route would take the students was studied briefly, contributing a basis for the study of our other world neighbors.

The students and teacher working together planned the world tour. Sample passports were made in the commercial department of the high school, modeled after those brought in by children whose parents had been abroad. The "travellers" left San Francisco and vicariously visited: Hawaii, Japan, China, Australia, East Indies, Southeastern Asia, Near East, Latin America.

Literary license was used in planning the tour. Nations particularly significant at the time, and whose relations with the United States were most important, were selected for visitation. As much as possible, a logical route was followed and when the countries or regions themselves were being studied, steamship posters and ship models were displayed in the room.

### SOURCES OF MATERIALS

However, the materials that did more than anything else to add realism to the course were those that were received from the various officers of the American Consular Service. Permission may not have been necessary, but was secured, to write to these various officers scattered in the "four corners" of the world. These names were secured from the State Department, Washington, D.C., and you can imagine the learning activities involved when the students wrote a letter to Walter A. Foote, for example, the American Consul in Batavia, Java. Practical letter writing, a rush to the world map to locate Batavia, and a growing conception that flesh and blood men in distant parts of the world carried on what many had thought were mechanical features of government were but a few of the useful outcomes in this phase of the program. Some

thirty consuls were contacted, as well as the foreign embassies in Washington, D.C., and the world began to flow into the somewhat shabby classroom.

However, the flood really began when the letters and packets, stamped with wax government seals, arrived in a steadily mounting stream. The officers of the Consular Service were most generous in both the time and materials that they sent, and, indirectly taught a warm civic virtue—that our government is human. Pamphlets, maps, posters, cards, books, etc., came in what seemed an unceasing procession.

#### USE OF MATERIALS

These were catalogued and their color added life to the study of the nations in our itinerary. Reports were based on the pamphlets, posters and maps were displayed, and a variety of individual projects were started, including the making of a stamp album containing stamps taken from the letters received and picture albums using excess materials received. In one corner of the room, a wooden screen, made by some of our boys and then stained, was covered with steamship labels, advertisements, etc.

Several of the teachers from English and Business and other departments who had travelled and lived in Mexico and Iraq brought their accumulated curios to class and explained them to the curious students. In this way, closer cooperation was developed between the departments and these teachers had an increased personal significance in the eyes of the students.

In addition to the various media already mentioned which brought the world much more closely to the geography classroom, one of the most important ones was the letter writing project carried on in cooperation with the English Department. In each of the letters sent to the American Consuls, a request was made that the names and addresses of schools with which we could correspond be sent to us. The replies were most encouraging and included eleven in Asia, four in South America, and the same number in Central America. It was never possible to correspond with all these schools but gift boxes, containing pictures of the class, the school paper, scenic folders, etc., were sent to St. Andrew's in Singapore and similar gifts were received in exchange. Other schools with whom we exchanged letters were located at Nagasaki, Japan; La Ceibe, Honduras, and Valparaiso, Chile. It was always a banner day when a letter arrived, depicting life as a youngster

saw it in some far-off place. Strangely enough the way he lived did not seem too different from living in the United States of America, and hence there was engendered an interest in these other people and a tolerance toward them.

#### CONCLUSION

World War II has been over now for several years, but the curtain of suspicion hangs heavy, and is charged with the lightning of future dangers. If the more practical Travel Geography courses are planned, and in the spirit of tolerance executed, perhaps it is not too late to do some good-will toward others and receive it in return. I know it helped my students and it may aid yours in a better understanding of the fact that we are all children of one God. If this truism is planted well, it may be that the day will come when "men will war no more."

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## THE AERIAL PHOTOGRAPH: A KEY TO THE CULTURAL LANDSCAPE

GEORGE A. STOKES

Louisiana State University

#### INTRODUCTION

A survey of recent geographical literature suggests that the aerial photograph, altho widely used in many fields of investigation, has been comparatively ignored in geographical research as a primary source of information concerning the cultural landscape. The use of the photomap by the intelligence agencies of many nations during the past thirty years, and the comments and observations of a few geographers, have led to the conclusion that a significant amount of the information and data usually obtained by time-consuming and expensive field investigation might be more economically derived from aerial photographs.

#### SOME SUGGESTIONS AS TO THE USE OF AERIAL PHOTOGRAPHS

There are undoubtedly many ways in which air photos may be profitably utilized by the geographer. Trewartha<sup>1</sup> has suggested their employment, with limitations, in the study of farmsteads.

<sup>1</sup>Trewartha, Glenn T., *Some Regional Characteristics of American Farmsteads*; *Annals Assn. of Amer. Geogrs.*, Vol. 38, 1948, pp. 169-225.

Joerg<sup>2</sup> has indicated that, since American cities are characterized by rapid and frequent change, the air photo may be used in the study of urban geography in this country. Light and Light<sup>3</sup> have presented a number of excellent pictures which graphically illustrate variances in forms of human occupance.

The above-mentioned only hint at the potentialities of this method applied to cultural geography. For example, the distinctive characteristics of buildings which serve different purposes appear plainly on the air photo, suggesting its service as a guide to the division of settlements into functional areas. Many new use patterns become visible to the observer, and once identified may be readily located in other, less accessible, areas. Photographs of a settlement taken at intervals over a period of years strikingly delineate changes in form and function, indicate the presence of new industries, and reflect directional tendencies of expansion. The increased employment of the air photo will doubtless reveal many more of its capabilities.

#### RELIABILITY OF INFORMATION OBTAINED FROM AERIAL PHOTOGRAPHS

The accuracy with which the air photo may be interpreted is of necessity limited by the skill and experience of the observer, and by his familiarity with the area under consideration. The photographs may, in most cases, be considered reliable for studies such as those mentioned in the preceding paragraphs, which involve general rather than extremely detailed interpretation, and for the compilation of data.

Cultural objects, appearing in their true form, are readily identified as to general character, tho their specific nature may be indeterminate. This difficulty in acquiring detailed information is a deficiency which is always present, tho it may be minimized by practice and by study of the various excellent guides to photo interpretation now available.

#### AVAILABILITY OF AERIAL PHOTOGRAPHS

Fairly recent photographs of the greater portion of the United States may be obtained thru the services of the Production and Marketing Administration, which maintains film libraries in Wash-

<sup>2</sup>Joerg, W. L. G., The Use of Airplane Photography in City Geography; *Annals Assn. of Amer. Geogrs.*, Vol. 13, 1923, p. 211.

<sup>3</sup>Light, R. and Light, M. U., Contrasts in African Farming, Aerial Views From the Cape to Cairo; *Geogr. Rev.*, Vol. 28, Oct. 1938, pp. 529-555.



FIG. 1

ington, D.C., and Salt Lake City, Utah.<sup>4</sup> Most county seats over the country make index mosaics available, enabling those interested to select the desired coverage.

The photographs may be had in various scales, the cost depending upon the size and scale of the reproductions, and the number of prints required.<sup>5</sup>

<sup>4</sup>Inquiries may be directed to the Chief, Aerial Photographic and Engineering Service, P.M.A., U. S. Department of Agriculture, Washington 25, D.C.

<sup>5</sup>The Bureau of Census makes use of photos at scales of 1: 20,000 (3" equal 1 mile) and 1: 8,000 (6" equal 1 mile). These scales are considered adequate for most purposes.

## RELATIVE MERITS OF MAPS AND AERIAL PHOTOGRAPHS

In some respects aerial photographs are superior to maps, and in others inferior. They excel maps in that they are usually more recent, contain much more detail, can be quickly prepared no matter how difficult the terrain, and the objects shown are portrayed in their true shape and appearance, rather than by conventional signs and symbols.

On the other hand, it may be difficult to determine relief, marginal data are usually incomplete, and distances and directions may not be exact. The latter objection, however, is not believed to detract from the value of the photograph, at least as far as the cultural landscape is concerned. Errors of distortion in the photographic processes are usually negligible, and the techniques of aerial photography are constantly being improved thru the development of better cameras, film, and methods of control.

### A COMPARISON OF THE VERTICAL, THE OBLIQUE, AND THE STEREO PAIR

The stereographic photo pair, the use of which has been described by Raisz,<sup>6</sup> is considered the most effective of the three primary types of aerial photo: the simple vertical, the oblique, and the stereo pair. The overlapping photographs viewed thru the stereoscope reveal not only those features seen in the vertical, but also give the observer a much clearer picture of the relief of an area and the relative heights of all visible objects. In view of these qualities the latter-named type of photograph is considered most valuable to the geographer.

The oblique may be used in the study of detail in small areas,<sup>7</sup> especially in the case of very small settlements. However, such photos are not generally obtainable.

### AN EXPERIMENT IN THE USE OF AERIAL PHOTOGRAPHS

In pursuing the study of settlements it is frequently necessary for the geographer, in order to determine the number and nature of functions served by a particular settlement, to divide that settlement into functional areas. During investigation of the potential capabilities of aerial photographs as applied to the study of cultural landscapes, an attempt was made to delimit the functional

<sup>6</sup> Raisz, E., *General Cartography*; 2d ed., McGraw-Hill Book Co., Inc., 1948, pp. 189-190.

<sup>7</sup> Hart, C. A., *Air Photography Applied to Surveying*; Longmans, Green, and Co., 1940.

areas of three Louisiana towns, using as sole sources of information air photos and topographic maps. A field check of the results proved the bounds and nature of the various areas so determined to be quite accurate.

In addition to the location of functional areas, which included commercial or business districts, white residential areas, Negro residential areas, industries and their nature, schools and other

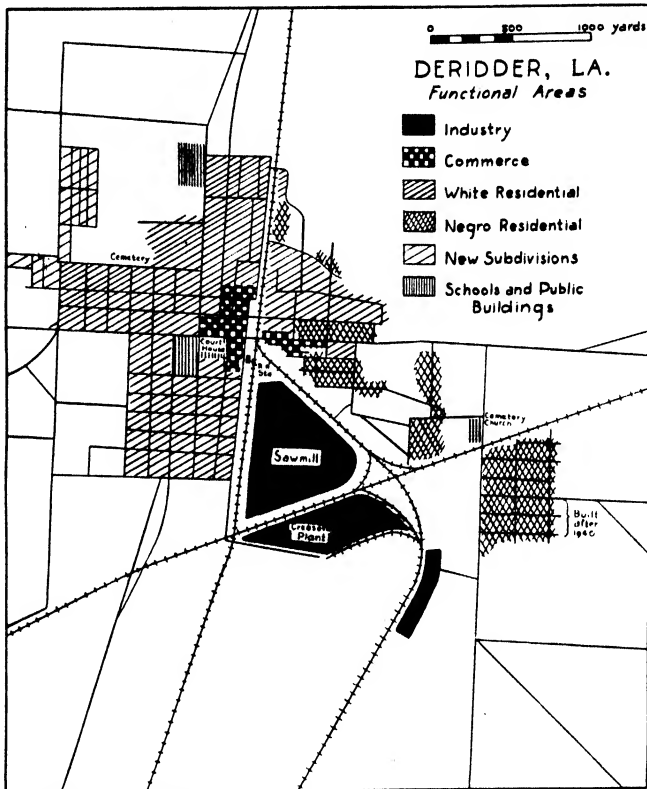


FIG. 2

public buildings, and new subdivisions, an attempt was made to locate and classify a number of individual features. This also proved generally successful, altho the only error of interpretation during the study occurred in this connection. Field investigation showed a building in Leesville, interpreted as a dance-hall or "drive-in," to be in actuality a warehouse (Fig. 3).

It may be of interest to note that in one case the field check

revealed a service station located at a point at which a hotel was seen on the photo (Fig. 4). Upon being questioned as to how long the station had been at that location, the attendant replied: "About seven months. There used to be a hotel here, but it was torn down not long ago."

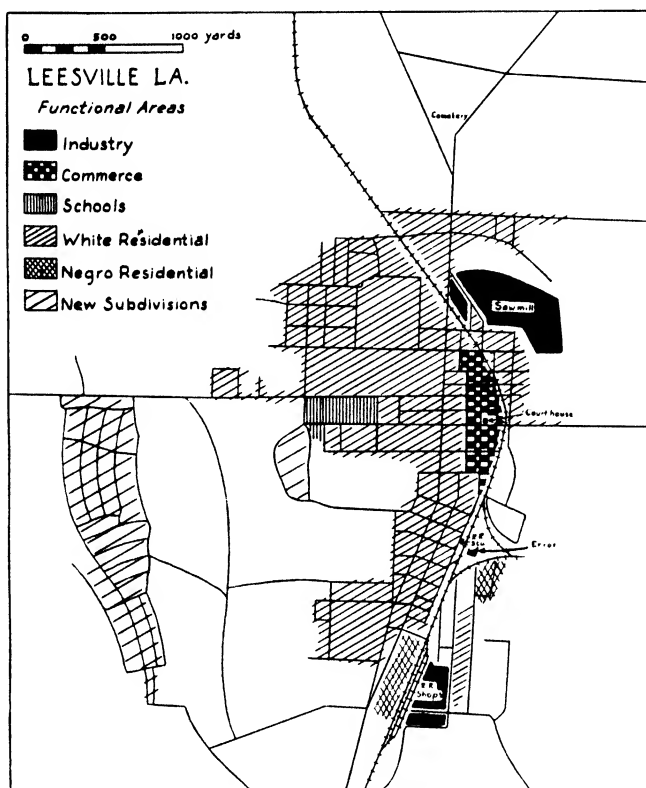


FIG. 3

### METHOD

Stereographic photo pairs, made in 1940 and having a scale of 1:20,000 were first obtained, the coverage including one town, Winnfield, Louisiana, which was known to the writer, and three unknowns: DeRidder, Leesville, and Oakdale, Louisiana. From these photos base maps of the latter three towns were prepared, and their functional areas delimited. The photographs of Winnfield, the known quantity, were used as a key to the interpretation of the other photos.

Next a series of photomaps prepared in 1944 and covering the same group of settlements was studied, and the locations of new subdivisions settled during the war were noted.

As a further check on the potentialities of the photographs, the stereo pairs were again studied in an attempt to locate and classify

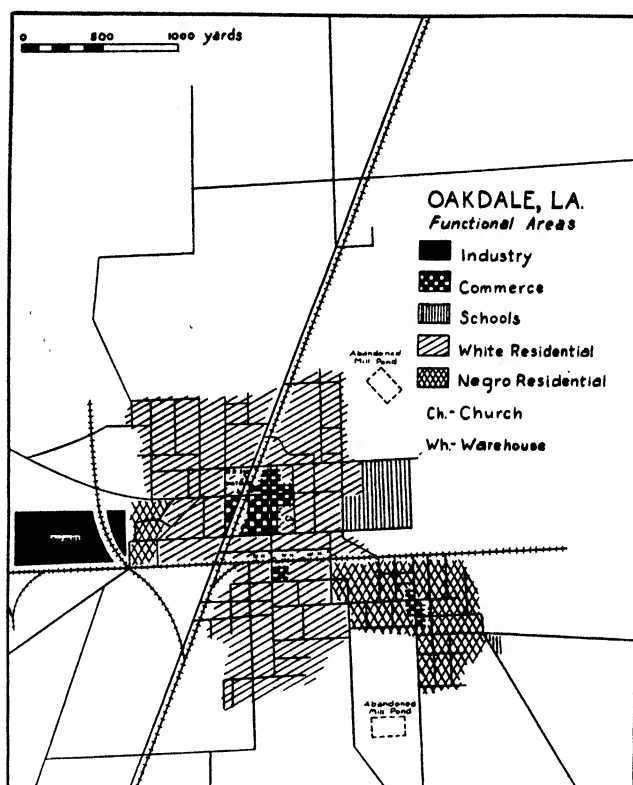


FIG. 4

a number of smaller, less prominent, features, such as churches, cemeteries, warehouses, and railroad stations.

The fourth step involved a comparison of the maps thus prepared with topographic maps of these settlements, which served to confirm the nature of a number of features already identified. In only one case did the topographic map yield additional information. Two rectangular forms appearing on the photos of Oakdale could not be identified. The topographic map indicated that they were water bodies, and on this basis they were interpreted as millponds

which remained after the sawmills they served had been moved. This was correct.

Finally, a field investigation of each settlement was made in company with a number of disinterested persons, during which the maps were checked for accuracy. The only error of interpretation has already been described.

#### LOCATION OF FUNCTIONAL AREAS

Each of the functional areas considered in this study exhibited certain prominent features which set it apart from its surroundings. Using the photographs of a settlement known to the writer as a key, these characteristics became criteria to be applied to similar areas in the unknown settlements.

Industrial areas were easily discerned, since the buildings are characteristically large, dark in tone, and are generally situated adjacent to transportation facilities. The nature of the industry may, in many cases, be derived from a study of the plant itself and its immediate surroundings. In this case sawmills were identified by the presence of lumber stacks, millponds, and logging roads. The creosote plant at DeRidder (Fig. 1 and 2) was revealed as such by the characteristic long, low, narrow buildings, in which are situated the tanks used in the treatment of timbers, and by the lumber stacks in the vicinity.

The commercial or business section of a settlement is usually characterized by its location, generally in or near the center of the town, the buildings appearing close together or having common walls, the latter making them quite distinct from residential areas, as does the general scarcity of trees.

Areas devoted to residences are normally recognized by smaller buildings spaced varying distances apart; still smaller outbuildings, such as garages; and the presence of scattered trees. Those areas occupied by whites almost universally exhibit better living conditions than are to be seen in Negro sections. The dwellings of the latter are crowded together more closely, are smaller, have fewer trees, poorer streets, and as a rule are found near those districts occupied by industrial plants.

Schools appear as buildings of considerable size, the most distinctive characteristics being the absence of grass on the adjacent playgrounds, and the presence of athletic fields. Other public build-

ings may often be recognized by their relative isolation from other structures in the business district, and by the landscaping of their grounds.

In determining the character of individual buildings the factors of location and association as well as size and shape must be taken into consideration.

### CONCLUSION

As a result of the foregoing study, the opinion is held that aerial photographs make available to the geographer a means whereby the cultural landscape may be studied with greatly reduced expenditure of time and money. The stereographic photo pair, supplemented by the topographic map, is particularly well adapted to the study of settlement patterns, especially those studies of a more general nature, not involving extremely detailed interpretations.

Familiarity with the particular type of cultural landscape under investigation is highly desirable, tho not absolutely essential. Such familiarity materially reduces the margin of error in interpretation, and facilitates the recognition of individual elements of the cultural pattern.

In the event that further and more detailed information, requiring field investigation, is desired, the time needed to satisfactorily complete such investigation will be materially reduced by a careful photographic study made prior to going into the field.

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## EDITH PUTMAN PARKER RECEIVES THE DISTINGUISHED SERVICE AWARD IN GEOGRAPHIC EDUCATION\*

The Distinguished Service to Geography Award was made to Edith Putman Parker, University of Chicago. Miss Parker has rendered distinguished service and leadership in geographic education for over a quarter of a century, and her services have given added dignity to her chosen field. She has exerted leadership in the field thru inspirational teaching, scholarly publications, activity in organizations working for continued development of in-service teachers, and pioneer research in geographic education.

Thru her inspirational teaching which includes and permeates all levels from the elementary thru the university to the adult, she has demonstrated superior teaching ability, and illustrates what may be accomplished by devoting a lifetime to teaching.

\*Because of sickness, Dr. Mary Jo Read, Chairman of the Distinguished Service Award Committee, was unable to attend the annual meeting. Dr. Thomas Barton, Indiana University, was asked to write and read the citation.

Her experience has continued thruout a period long enough to reveal the permanent value of the influence exerted.

During the recent war, when the unprecedented need arose to provide maps in vast quantities for the armed forces, she planned and directed an intensive course of training in twenty colleges to prepare young women for the work of supervising map-making.

People not fortunate enough to have studied in her classes, have grown in geographic stature thru contact with her publications. Her leadership in geographic education first attained national attention in the early 1920's thru her part in preparing a revolutionary series of elementary-school textbooks in geography. She has also stimulated geographic thinking thru numerous professional articles and the editorship of a series of maps and charts.

She has exerted leadership thru active participation in the work of organizations which aim to secure better teaching of geography. You are familiar with her worthy contributions to our programs and with her services as our president, associate editor of the JOURNAL OF GEOGRAPHY, and as a builder of our organization in many ways. You know of and appreciate the large part she took in the preparation of the *Thirty-Second Yearbook of the National Society for the Study of Education on "The Teaching of Geography."* Her contributions to Part IV of *Report of the Commission on Social Studies* and to the *Nineteenth Yearbook of the National Council for the Social Studies on "Geographic Approaches to Social Education"* have been milestones in educational geography.

Constant, steady endeavor to advance the frontiers of research in geographic education has been one of her life-long goals. She has opened an entirely new division of geographic research, namely, the geography of education. Thru her seminar, she has directed graduate-student research in this field at the doctorate level.

By these and many other activities, Miss Parker has proven herself to be a great builder in the field of geography. In this, her chosen field, she has repeatedly demonstrated her originality, her keen insight, her resourcefulness, and her many other talents. She has given dignity and respect to the terms "geographic education" and "educational geographer." By conferring the Distinguished Service Award, the highest honor which the National Council of Geography Teachers can bestow, on Miss Parker, the committee is also honoring the National Council of Geography Teachers.

Committee: Harry O. Lathrop, Alisen Aitchison, George B. Cressey, J. Russell Whitaker, Earl B. Shaw, M. Melvina Svec, and Mary Jo Read, Chairman.

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## JOURNAL OF GEOGRAPHY PRIZES

In January, 1947, we had the pleasure of announcing a series of prizes, to be awarded to contributors of outstanding articles that have appeared in the JOURNAL OF GEOGRAPHY. These prizes are made possible by the generous contribution of one of America's eminent geographers who insists on remaining anonymous. The donor is convinced: 1) "That the fine service contributed over the years by the editors of the JOURNAL merits far more recognition than it has received. These prizes honor them. 2) That the receipt of the prizes by the authors of the articles judged best will encourage these authors and other authors, with the result that additional excellent manuscripts will be offered for publication in the JOURNAL. 3) That public recognition of worthy achievement will help not only those who receive the recognition but also those who participate in any way. Indeed the public will think better of geography and of the JOURNAL when it learns of these prizes." Under the terms of the gift the President of the National Council of Geography Teachers is directed to appoint committees to make the award. The Presi-

dent is *ex officio* a member of each committee. Eight awards have now been established in honor of the following: Richard E. Dodge, Ray H. Whitbeck, George J. Miller, J. Paul Goode, Almon E. Parkins, Ellsworth Huntington, Isaiah Bowman, and Cora P. Sletten. Each recipient receives an award of twenty-five dollars.

#### ISAIAH BOWMAN PRIZE, 1949

Dr. Bowman was formerly Director of the American Geographical Society, President of Johns Hopkins University, Editor of the *JOURNAL OF GEOGRAPHY*, Chairman of the National Research Council, President of the Association of American Geographers, and served as a consultant for the federal government and as an official representative on many occasions. The prize in his honor is "for an article dealing with political geography, South America, or Pioneer Regions." The prize was awarded at the recent Cleveland meeting of the National Council to Dr. J. W. Coulter, now serving with the United Nations, for his article entitled "The United States' Trust Territory of the Pacific Islands" which appeared in October, 1948.

#### CORA P. SLETTEN PRIZE, 1949

Cora P. Sletten is Professor of Geography, State Teachers College, Mankato, Minnesota, a former President of the National Council of Geography Teachers, and Assistant Editor of the *JOURNAL* for twenty-three years. She has been a constant contributor to the work of the National Council and the *JOURNAL* and to the advancement of geographical education. The prize is "for a paper by a woman or for three or more reviews by the same author." The prize was awarded at the recent Cleveland meeting of the National Council to Villa B. Smith, Cleveland, Ohio, for her article entitled "The Bulk Freight Trade of the Great Lakes" which appeared in October, 1946.

#### PRIZES FOR 1950

Two prizes will be awarded in 1949 for outstanding articles published in the preceding five years in the *JOURNAL*. The Richard E. Dodge prize is for an article "dealing with some influence upon mankind of some aspects of physical geography, judged to have been helpful to the largest number of *JOURNAL* readers." The Ray Hughes Whitbeck prize is for an article "dealing with some influence upon mankind of some aspects of economic geography."

The staff of the *JOURNAL* wishes to again take this opportunity to express its great appreciation of the generous gift which has made the awarding of these prizes possible.

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### NATIONAL COUNCIL AT WORK

The National Council is fortunate to have Miss Ina C. Robertson, State Teachers College, Valley City, North Dakota, accept the chairmanship of the important "Committee on Standards of Teacher Preparation and Certification." Other committee members will soon be chosen and committee work will be under way during 1950.

The "Committee on Preparation of Bibliographies and Lists of Maps" has been one of the active committees of the National Council during the past year and a summary of their 1949 report follows:

Three projects are under way: a list of sources of maps for educational use; a list of materials useful in map activities; and a bibliography on the use of maps in geographic education.

We have completed an annotated bibliography of all articles on maps and their use that have been published in the *JOURNAL OF GEOGRAPHY*, from 1922 to October 1949. In addition, the articles on these topics that have appeared in other magazines in recent years have been listed and many examined. Work remaining includes an examination

of these materials and the difficult problem of selecting those references that will be of greatest value to teachers.

Altho not a part of our assigned task, we plan to analyze the topics treated by the articles in educational magazines. The survey has made us conscious of a need for more articles on maps and their uses in the JOURNAL OF GEOGRAPHY and all other magazines that reach teachers.

The committee expects to turn the materials compiled over to the Publications Committee within the next few months.

MARGARET CHEW

GEORGE CORFIELD

KATHERYNE T. WHITTEMORE, *Chairman*

Your president wishes to thank all committee personnel, all officers, and all others who contributed to the work of the National Council during the last year. He is especially grateful to the many who worked so hard and gave so much thought and effort for the success of the 35th Annual Conference. The future of the National Council of Geography Teachers as a working organization will show great progress with a continuance of such splendid cooperation.

EARL B. SHAW, *President*

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## EDITORIAL NOTES AND NEWS

During 1949 scientific geography and geographic education suffered a great loss by the passing of four eminent leaders. Dr. Wallace W. Atwood, former President of Clark University, founded the Clark Graduate School of Geography. Dr. Elmer Eblaw helped establish and for years edited *Economic Geography*. Mark Jefferson started more men who became outstanding geographers than any other American geographer except William Morris Davis. Dr. O. E. Baker established the Department of Geography at the University of Maryland and gained world renown as an agricultural geographer. All of these men were inspirational teachers; fatherly advisors to potential professional geographers; careful research workers; and each contributed much to the geographic literature of our times.

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The new England Geographical Conference took its fall Field Trip on October 1 and 2, 1949 in the Hanover area. Planned and conducted by the Dartmouth geography staff (Trevor Lloyd, Van English and Albert Carson) the trip included Wilder Dam on the Connecticut River, Mooselauke Ravine, Lost River, Franconia Notch, Cannon Mountain, and Weirs on Lake Winnepissaukee.

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The soy bean has made a rapid growth as a commercial crop in the United States. At the turn of the twentieth century only a few thousand bushels were grown in the United States. Now nearly eleven million acres are planted to this crop and the annual production is about two hundred million bushels.

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Will a tunnel be constructed under the Strait of Gibraltar to connect Europe with Africa? Survey work has been resumed on this fifty-two year old project. Such a project would complement the recently resumed Cape-to-Cairo railroad project and provide a supply line between the two continents free from the submarine menace and less exposed to atomic bomb attack.

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In 1948 the United States received most of its manganese ore from the Soviet Union, the Union of South Africa and Brazil.

Do geographers in the United States have a list(s) of any large-scale, published or unpublished, objective scientific researches on the teaching of geography in the schools? In October, 1945 the Geographical Association in the British Isles received a letter from the Professor of Methods of Teaching Geography in Moscow asking for an account of all objective scientific researches on the teaching of geography in the schools of the British Isles. Professor N. V. Scarfe provides "a list of all the known scientific researches with a short review of the contents and conclusions of those that have appeared in print" in an article entitled "The Teaching of Geography in Schools: A Review of British Research" published in the June, 1949 issue of *Geography*.

The Northwest Ohio Section of the Ohio Council of Geography Teachers sponsored a sectional program at the Northwestern Ohio Education Association's meeting. Lyle R. Fletcher, Bowling Green State University, Bowling Green, read a paper entitled, "Need for an Adequate School Curricula and Teacher Training Program in Geography for Understanding the Position of the United States in World Politics" and a film, "Green Harvest" was previewed.

The airplane may become an efficient and economical forestry tool. During the winter of 1948 an airplane was used in a reseeding test made on a burned area in York County, Maine. The white pine seed was mixed with from three to ten times its bulk in sawdust and scattered by the plane upon a blanket of snow. First seed counts show fairly satisfactory results. The airplane is also being used in spraying tests.

Whitehorse, the largest settlement on the Yukon River system, has been selected as the base for the combined United States and Canadian joint defence maneuvers this winter. Whitehorse is sometimes called the transportation crossroads of the upper Yukon because: 1) It is at the head of navigation on the Lewis-Yukon river system; 2) It is the northern terminus of the White Pass and Yukon Railway; 3) The Alaska Highway skirts the town; 4) Airplanes from Fairbanks, Seattle, Vancouver and Edmonton use its airport.

## GEOGRAPHICAL PUBLICATIONS

E. W. Shanahan. **South America, an Economic and Regional Geography with an Historical Chapter**, seventh edition, revised, 318 plates, E. P. Dutton and Co., Inc., New York, 1948, \$4.00.

This is a short treatment of South America, now in its seventh edition, the first having appeared in 1927. Of the twenty-two chapters, six provide a general picture of the physical framework, climate, settlement, communications, plantation agriculture and general economic conditions of the continent. The other chapters treat the regionality of the area. Fifty-one maps and diagrams supplement the text, altho some of them are little more than sketch maps. A new map showing air routes in operation has been added, but there appears to be no other significant addition to, or alteration of the preceding edition, hardly enough to be classed as a revision. Secondly, the bibliography has not been brought up-to-date. It contains only one item published since 1940, and only three that were published later than 1933.

The text, despite its brevity, is reasonably thoro and is quite readable. The chapters on Brazil and the Argentine are particularly well done.

ALDEN CUTSHALL

Chicago Undergraduate Division  
University of Illinois

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VOLUME XLIX

FEBRUARY, 1950

NUMBER 2

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## LOS ANGELES: ITS AQUATIC LIFE LINES

OSCAR OSBURN WINTHER

Indiana University

### ACQUIRING A WATERSHED

As fanfare ushered in the present century, no other American city seemed to offer a more glowing future than did Los Angeles, then a city of one hundred thousand and the nation's leading spa. It was, moreover, the recognized metropolis of the Southwest. Actually, tho, there was good reason for pessimism. Los Angeles, built on the fringe of the scorching Mohave Desert, faced the prospect of ruinous drought. Noble Los Angeles River, the city's source of drinking water since the Spanish days, was running dry; natural underground reservoirs were being emptied by pumps; and an anxious Water Board, scouring the sun-baked countryside, saw no relief in prospect. In 1904 the crisis came. "The question of water supply," reads the *Yearly Report* of the Los Angeles Water Board, "has reached the acute stage."

At such a time former Mayor Fred Eaton must have appeared like a Moses in modern dress when he came to the City Water Board with news that he had found a new water supply for Los Angeles.

Eaton liked to be out of doors, and in the summers he often went on camping trips. One of these trips took him to Owens River Valley in Inyo County, 250 miles away and high above Los Angeles in the Sierra Nevadas. Dominating the scene was Mount Whitney, America's loftiest peak, and down its sides came melted snows that formed the icy fresh and pure waters of Owens River. The river emptied into Lake Owens, a brackish stagnant body with no visible outlet to the distant sea. To Eaton it seemed a pity that this mountain fresh river should serve no better purpose than the filling of a desert lake. He believed it possible to divert the river from the

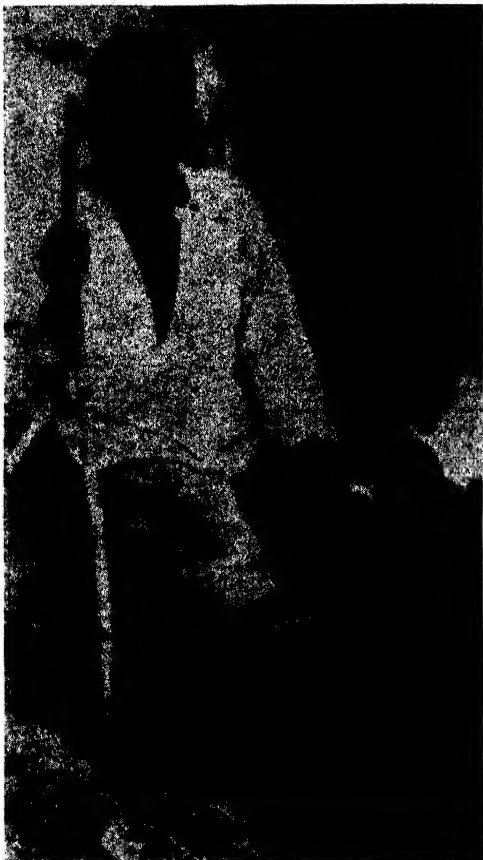


FIG. 1. A Zanjero. Guardian of Los Angeles' water supply when it ran thru town in open ditches.

lake to an aqueduct leading to Los Angeles, and he decided to approach that city's Water Board regarding his scheme.

For advice on the practicality of the idea, the Board turned to its chief works engineer, Belfast-born William Mulholland. Tall, gauche, sagacious "Bill" Mulholland had come to Los Angeles in the late 'seventies and had begun his career as a humble *zanjero* or caretaker of the water ditches. He was of the race of "doers," tempering his activity with common sense and a timely thrift that was pleasing to the then extremely frugal city administration. Mulholland was fond of saying that he learned the virtue of frugality from his Pittsburgh uncle who tied his goat on a tin roof near the railroad

tracks. Every time a train went by, the firemen heaved coal at the goat and Mulholland's uncle hurried out to collect the addition to his winter's fuel supply.

Mulholland surveyed the Owens Valley project and reported to the water commissioners that, from an engineering standpoint, it was both possible and practical. He estimated the cost at approximately 23 million dollars—a staggering sum that the commissioners figured could be raised only by sale of municipal bonds. He saw only one major obstacle—trouble over the water rights of Inyo County farmers and the newly-created United States Reclamation Service which in 1902 had selected Owens Valley as one of its proposed irrigation developments.

Then a remarkable thing happened. J. B. Lippincott, Reclamation Service representative, suddenly resigned from the federal

agency and accepted a position with the Los Angeles Water Board. Simultaneously, the Reclamation Service decided to drop the Owens Valley project and the cause of the Inyo County farmers in favor of the aqueduct scheme.

Up to this time, in spite of a rapidly widening area of involvement, the aqueduct plan had remained the secret of a small number of "insiders"—a group that included members of the Los Angeles press and which seemed to have a single idea, viz., obtaining all possible land and water options in the territory to be touched by the aqueduct.

On June 29, 1905, however, the *Los Angeles Times* broke the gentlemen's agreement regarding simultaneous publication of the story. "Titanic Project to Give City a River Option Secured on Forty Miles of River Frontage in Inyo County—Magnificent Stream to be Conveyed Down to the Southland in Conduit Two Hundred and Forty Miles—Stupendous Deal Closed," ran the *Times* headline, full of the traditional California superlatives.

The *Times* story described the project as the most important development in the history of Los Angeles and added that plans

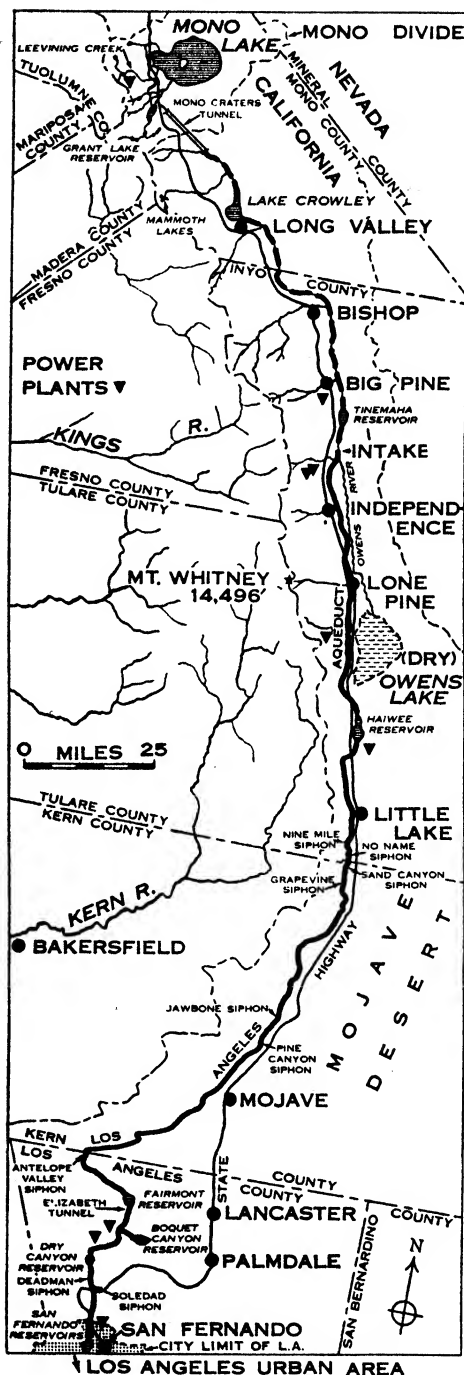


FIG. 2. Map of the Municipally Owned Los Angeles Aqueduct. Drawn by Ronald Ives.

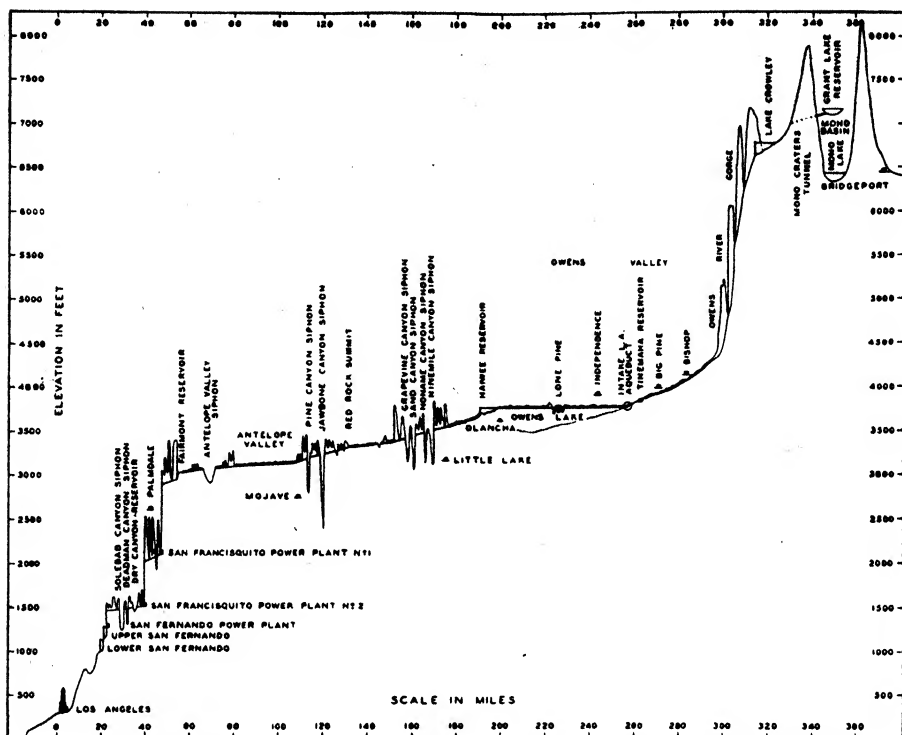


FIG. 3. Elevations of the Los Angeles Aqueduct.

called for the sale of water to San Fernando Valley where General Harrison Gray Otis, editor of the *Times*, his son-in-law, Harry Chandler, and E. T. Earle of the *Los Angeles Express* (all sharing in the secret) were personally acquiring property at ridiculously low prices. That enormous profits could be made out of such real estate investments was indeed inevitable.

Subsequent to the public announcement, the United States Congress passed a bill which was signed by President Theodore Roosevelt which not only removed federal restrictions but removed all limitations on Owens River water for use by Los Angeles. Gifford Pinchot, chief of the Forestry Bureau, also lent his support to the aqueduct plan when he declared 200,000 acres in Owens Valley to be "forest" (altho no forests were in sight) and thereby put an end to further homesteading and settlement in the region. Also an Act of Congress (June, 1906) gave to Los Angeles a right-of-way over public lands.

And so on November 24, 1905, the Los Angeles City Council voted to take up its cheaply acquired options on Owens Valley

land and water rights. "This action means," wrote Hearst's *Los Angeles Examiner* on the day following, "that the city has officially accepted the Owens River water project as proposed, and work will proceed toward construction of the conduit and bring water to Los Angeles." Each step taken by Los Angeles and the United States government was technically legal and the prevailing philosophical justification was: the greatest good for the greatest number.

When the *Times* had first revealed the aqueduct story in June, it had carried a box story dispatched directly from Owens Valley



FIG. 4. Aqueduct Construction Operations. This is a siphon section weighing twenty-four tons being pulled by mule teams.

in which it reported "Everybody in the Valley has money and everybody is happy." This was not wholly true. In fact, a large percentage of the Valley's inhabitants were very unhappy.

To the farmers of the region, providing water at their expense for Los Angeles seemed scarcely justifiable. To take water needed for agriculture and sell it to the speculators who were planning a fertile, fruitful San Fernando Valley was an outrage and a "betrayal of Inyo County."

From this point on, the people of Owens Valley staged a prolonged and dogged resistance to every subsequent move made by Los Angeles—some of them even resorting to open violence and bloodshed. But in the end the battle was a losing one.

#### LOS ANGELES BUILDS WORLD FAMOUS AQUEDUCT

Permanent construction of the Los Angeles aqueduct under Mulholland's direction began in October 1908. In an age when

municipal projects inspired little confidence, the building of the conduit, largest municipal enterprise of the time, was accomplished with such speed, skill, and economy that it became one of the marvels of the engineering world.

Its course began at an intake point 12 miles above Independence and with an elevation of 3,814 feet. Its terminal point, the San

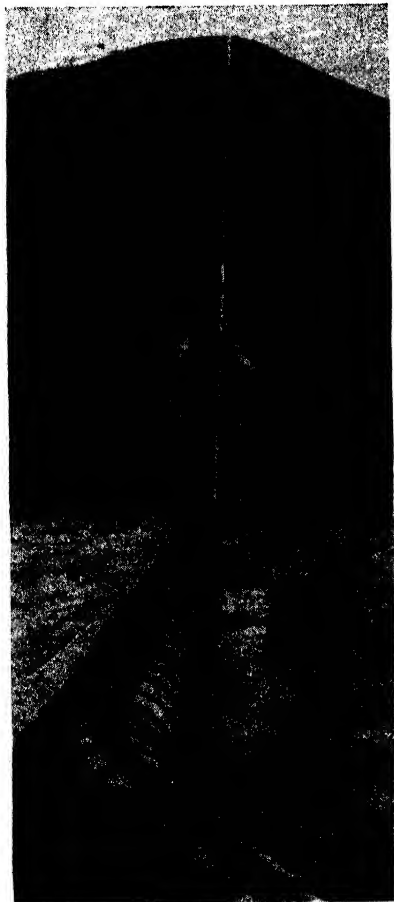


FIG. 5. Famed Jawbone Siphon. The most spectacular of numerous siphons of the Los Angeles Aqueduct.

Fernando Reservoir, had an elevation of 300 feet. In traversing the distance from beginning to end, the aqueduct skirted the east side of the Sierras and crossed Mohave Desert before reaching Los Angeles. Because of the varied terrains and levels, many types of conduits were used, among them huge steel inverted siphons, but the standard conveyor was a concrete lined ditch 8.2 feet high, 11.5 feet wide at the top, and having a reinforced concrete cover.

Construction operations also necessitated building of desert and mountain roads, water for construction needs, electrical power and machinery, telephone lines, machine shops, barns, stables, and blacksmith shops. Plans had to be made, too, for the feeding, housing, and medical care of the 4,000 construction workers scattered along a route where alkali dust storms were numerous and where the temperature ranged from  $110^{\circ}$  in the summer to below zero in the winter.

The city manufactured much of its own cement, bought its own livestock and vehicles, and organized its own transport facilities along the desert mountain route. Twelve animal teams were hitched to two-wagon outfits to haul equipment from rail terminals. Tractors, some of caterpillar type, were tried for traction work, but

at that time repairs and operation costs for them made their bids run to about twice those of the teamsters.

By far the most difficult phase of construction was the building of 164 tunnels that covered a total of 42.9 miles. All construction plans were geared to the time it would take to complete the longest of these—the Elizabeth tunnel—which ran 26,870 feet. It was completed February 28, 1911, 450 days ahead of schedule and in world-record time for tunnel-building.

On November 5, 1913, the Los Angeles Aqueduct was officially opened, "carrying water," according to the *Los Angeles Examiner*, "farther than it had ever been carried to any city in the world." Running at one-third its capacity, it provided the Los Angeles of 1913 with three times as much water as it could then use.

Thirty thousand people crowded around the San Fernando outlet that day to acclaim the work of William Mulholland. "The horns of thousands of automobiles blared," wrote the *Examiner* in describing the occasion of the opening; "two field guns roared a quick salute . . . the band played 'Yankee Doodle.' " Then the gates opened and the water rushed in. This time it was Mulholland, not Eaton, who was a modern Moses, for literally he had smitten the rock and water came out of it.

#### DRY CYCLES AND TROUBLES

Not until the early 'twenties when a succession of dry years occurred did the Angelinos fear for their water supply again. Water in the aqueduct then began to run low. About half of the water was used for irrigation in San Fernando Valley, and at the rate of 1924 consumption the city's reservoir held only a four months' supply. Engineers rushed out into Owens Valley and installed huge electrically driven pumps in the hope that water pumped into the aqueduct could compensate for what the streams failed to supply. But this too proved inadequate.

Thoroughly alarmed, the city set its eyes on the far north end of Owens Valley which had hitherto escaped exploitation, and once again trouble broke out in Inyo County. Using high-pressure methods, city agents secured control of the McNally ditch connecting with Big Pine ditch, which irrigated the farms around the town of Big Pine. Trouble broke loose when in an effort to divert this new source of water into the aqueduct system Los Angeles engineers sought to construct a short connecting canal. To the

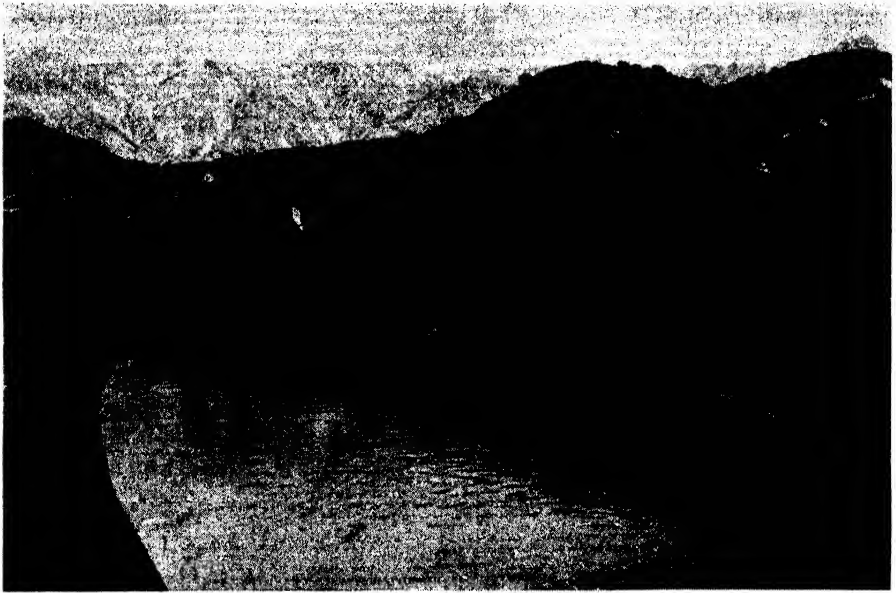


FIG. 6. Fresh from the Snowclad Sierra Nevadas. An open concrete lined section of the Los Angeles Aqueduct in Owens Valley above Intake.

ranchers who owned the Big Pine ditch, the City's move represented a further threat to Inyo water rights. Big Pine ranchers loaded rifles and shotguns and drove off the city workers.

Faced with this situation, Los Angeles bought out en bloc the Big Pine district for over a million dollars. The sale, however, did not include the town of Big Pine, a community with a new \$100,000 school, a church, bank, business district, and many fine homes; and its residents, left literally high and dry, faced inevitable ruin.

But the city continued buying on a "checkerboard" system. Bishop, the "hub" of Inyo County, felt threatened. Those who failed to sell faced possible ruin, and resentment continued to rise until November 10, 1924, when a mob of about one hundred Bishop men seized a vital spillway and diverted the water back into Owens Lake. The insurrectionists soon reached a thousand in number. They stood guard in relays while the women of the Valley kept them supplied with food.

It looked like impending civil war. Owens Valley men felt "goaded to desperation," according to the *Owens Valley Herald*; several Los Angeles papers referred to them as "mobs" and "anarchists." The *Bulletin* of the Municipal League of Los Angeles on July 15, 1924, tried to summarize the situation fairly:

"Discounting much of what he hears as sheer bluff, an observant visitor must nevertheless admit an ugly situation. And an important factor is the city's program of the past eighteen months of buying out the ranchers individually with the result that those who refuse to sell are isolated in areas containing farms which the city has allowed to lapse back into semi-desert condition." Many settlers left in the southern end of the Valley were friendly to Los Angeles, but those in the north end the *Bulletin* found fuming with discontent.

Reversing its former position, the *Los Angeles Times* now took a calming view. "It is to be remembered that these farmers are not anarchists nor bomb-throwers, but, in the main, honest, earnest, hard-working American citizens who look on Los Angeles as an octopus about to strangle out their lives. . . . There must be no civil war in Southern California."

Shortly after this, Los Angeles made offers of settlement, and the men from Bishop withdrew. When nothing much came of the offers, occasional dynamitings occurred and Mulholland received death threats, so he said, "by the dozen."

In summarizing the controversy, W. A. Chalfant, out-spoken Bishop publicist and editor of the *Inyo Register*, wrote on November 27, 1924: "Inyo has no resentment at the city, but at those who are permitted to lord it over Owens Valley for a score of years. The development of one of the best parts of California has been crippled, possibly killed. . . ." And on January 7, 1925, he wrote again of the gloom that had settled over the Valley: ". . . coyotes howl now where the voices of youngsters once made the little schoolhouse an influence in the community for good."

Since then, the city of Los Angeles very largely has had its own way in Owens Valley and has continued to make purchases there until now it controls approximately 80 per cent of the land. To ease the hardships of the stricken towns, Los Angeles also has purchased municipal property in the Valley. Farmers—about equal in number to those who were in the Valley when the aqueduct was first conceived—continue to live on the remaining 20 per cent. Los Angeles now controls the entire Owens River watershed, and the residents at present largely depend upon the Southwest metropolis for water. During wet cycles when there is a surplus of water the cry in the Valley is to have more acreages put to the plow. But to such incantations Los Angeles turns a deaf ear. Weather goes in cycles, it is pointed out, and dry years are ahead. The city must be

prepared for such eventualities. The economy of Owens Valley must remain much as it is: controlled and stable.

### THE MONO BASIN EXTENSION

Apart from the sociological implications, time has proven that the engineering world was justified in acclaiming this great construction feat. Today, after the lapse of a third of a century, the same aqueduct supplies Los Angeles with most of the water needed. Changes in the conduit have been made here and there and rough edges have been removed so that, at present, the aqueduct is 20 per cent more efficient than it was in 1913.

During the middle 'forties Southern California enjoyed one of its wet cycles and actually had water to throw away in Owens Valley. Much of this surplus was turned to good uses, for instance, to irrigating grazing lands, but much of it was spilled in the long-dry Owens Lake bed. The reappearance of water there invited lawsuits from firms exploiting the chemical deposits in the lake bed. This ironical situation caused Laurence E. Goit, Chief of the Los Angeles Water Bureau to remark in 1945: "There's no peace. First we're sued for drying up Owens Lake; now we're being sued for wetting it up."

The increased capacity of the conduit justified, during the thirsty 'thirties, a 38 million dollar extension into distant Mono Basin, over 7,000 feet above the sea. Once again Los Angeles demonstrated its capacity for doing things in the Gargantuan manner. Engineers bored a tunnel under the mushy 8,000 foot Mono craters, a feat which included the sinking of shafts 900 feet in depth. Desperate battles with carbon dioxide gas and steaming water threatened the lives of a thousand workers engaged in the tunnel construction. At one point, water streamed into the unfinished tunnel at the rate of 20,000 gallons a minute, and it required the use of eighty electrically-driven pumps to keep the hole dry.

In its now completed form the Mono Extension taps the waters of an additional four good-sized Sierra streams. The most northerly of these, Leevining Creek, has its source at Tioga Pass, only ten miles from San Francisco's famed Hetch Hetchy District. "If things get tough," jokingly remarked Wayne W. Wyckoff, affable engineer in charge of the Los Angeles aqueduct, "we may have to bore thru the summit of the Sierras and tap some of San Francisco's water supply." It could be done.

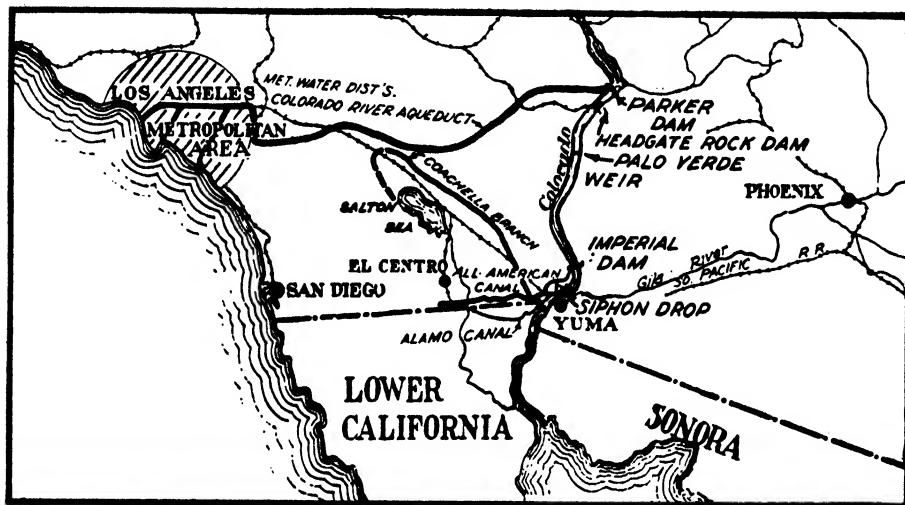


Fig. 7. Colorado River Aqueduct of Metropolitan Water District. Drawn by Ronald Ives.

The Mono Basin Extension has increased the available water supply by 40 per cent, and in its penetration of the Mono Valley, Los Angeles has happily avoided many of the headaches occasioned in the Owens region. Said H. A. Van Norman: "I don't think people in the [Mono] Valley need to be apprehensive. They're going to get a square deal." Even so, the arrival of a Los Angeles City car at the court house in distant Bridgeport, seat of Mono County and about 375 miles from Los Angeles, is viewed with suspicion by the cattle growers. "Wonder what ranch the City is getting this time?" they ask one another. Moreover, historic Mono Lake, like its sister to the south, is drying up, and owners of lake shore property are besieging Los Angeles with complaints that their once beautiful lake view is turning into a blinding white salt flat.

### THE METROPOLITAN WATER DISTRICT

Los Angeles has limitless aspirations. It now claims to be the third largest city in the United States and hopes to become the largest. In recent years it and its municipal neighbors (those yet unannexed) have been looking for still newer sources of water to insure future growth. They have found this extra water in the historic rampaging Colorado River.

No less than thirteen cities in Los Angeles and Orange counties pooled their material and political resources and formed the Metro-

politan Water District, secured federal approval and appropriations, and today are the proud possessors of the 242 mile Colorado River Aqueduct fed from Parker Dam.

Ever since Thomas H. Blythe diverted Colorado River water at Palo Verde Valley in 1856—the first recorded use—there had been a multitude of schemes and surveys calling for extensive use of the Colorado River. But not until construction of great Boulder Dam with all its attending compacts and agreements could the Metropolitan Water District, organized in 1928, provide the means for tapping the silted waters of the Colorado.

The project was extremely costly; the issuance of \$220,000,000 bonds was authorized by the voters in 1931 and the Depression-born Reconstruction Finance Corporation and Public Works Administration were the obliging federal agencies which made possible the raising of the cash and actual construction of this second great aqueduct.

Once again a construction marvel was performed. In a narrow rock outlet below mighty Boulder Dam, Parker Dam arose and provided for 717,000 acre feet of drinking water. The now completed aqueduct is an amazing network of tunnels—92 miles of them—beautifully lined canals, covered conduits, inverted siphons, reservoirs, power plants, and pumping stations. And into the drinking cups of metropolitan Los Angeles now goes water which has its ultimate source in far distant glaciers of the Wind River region in Wyoming. For the present it would appear that Los Angeles has won its half-century-long fight for water. But if migration to southern California continues at its recent accelerated pace, no one can predict with accuracy how long it will be before the City Fathers will have to look for another miracle man who will be able to keep the faucets from running dry.

## THE RACIAL PROBLEM OF SOUTH AFRICA\*

RODERICK PEATTIE

Ohio State University

The veld country of South Africa, is indeed, a young country, young not only in its short duration of occupance, but also immature and unsettled in its ways. It is a land where a man can make his own destiny according to his strength and courage, and men of the veld are characterized by eagerness for the struggle and expectancy of victory. All men have certain courses plotted for them by their cultural inheritance and, moreover, men live within the limitations of their environment. But in the veld country European cultural inheritance is largely set aside and the environmental limitations have not yet been met. The veld man on the platteland sits in his saddle as if the world were his servant. Even the businessman is filled with this frontier spirit. And the ever present human conflicts and competition which man cannot avoid are open conflicts. This lecture is about those conflicts. There is the struggle to adapt the veld environment to man's purpose. As one considers the soil erosion and the decreasing fertility of crop land and range, it might seem as if man were losing the battle. But, in addition, it is not yet determined who owns this plains land, who has the right to exploit it. The Bantu invaded the South African veld just ahead of the Boer. And the Boer was not well entrenched before the Briton arrived.

Today, the core land, the veld does not yet have its ownership determined. Generally, very generally speaking, the Boer controls the land while the Briton owns the mineral rights. Most of the consumers' goods are manufactured in factories owned by people of English descent if not actually in factories in England. This is commercial imperialism. The Boer resents the English origin of his goods because he resents past British political imperialism. But we must not forget the Bantu. For altho he lost his first fights for the veld land, he and his non-European allies are numerically superior to Boer and Briton combined, by four to one. He is gaining political wisdom and, once organized, may come to dominate the veld.

Any possible local supremacy of a colored race over the white is

\* Presented at the Cleveland meeting of the National Council of Geography Teachers, November, 1949.

frightening to most white people; in the Union much legislation concerning natives is motivated by fear. The leading philosopher of the land, a man with a white beard and a wit not unlike Shaw's, told me that unless Boer and Briton cease their conflicts against each other and join forces, a black fascism in the Union is inevitable. This came not from a reactionary but from a liberal who was active in native social improvement. I got the same opinion from the editor of a leading liberal monthly. Perhaps the country's most important corporation lawyer told me that the wise man will make as much money as possible from the land and will know just the right moment to retreat before the black overthrow of the economic system.

### "THERE ARE NO SOUTH AFRICANS"

An intellectual and liberal in the Union has written a stimulating book entitled, *There Are No South Africans*. Essentially he is right. The land is by priority a black man's country. The Hottentots and Bushmen in the southwest were indigenous folk, but there are few pure-blooded members of those groups left and these are of little consequence. The Bantu arrived in the eastern sections not very long before the Dutch and the black migration was still in progress as the Great Trek went eastward. Malays, Chinese, and East Indians were imported into the country, as well as West African slaves. The Afrikaners and the British control the land today. The English say it takes seven years to make a South African. But the English and the Dutch descendants are so distinct that a single South African racial type has not been evolved. Added to the complex are French Huguenots and Germans. But it is a complex and not an alloy. South Africa lacks the melting-pot concept of America. Lastly, there are the refugee Jews. It is in a sense an injustice to say there are no South Africans after remembering the Union's splendid war effort, but there still remains much conflict, too much conflict, among the groups.

In 1936 the population divisions ran:

Bantu .....	6,596,689
European .....	2,000,857
Colored .....	769,661
Asiatics .....	219,691

The largest group is the Bantu people; tho statistics are quite inaccurate, they form close to 70 per cent of the total. Their rate of increase is notable and probably would be greater if nutrition

were more adequate. To these must be added a considerable number of mine laborers temporarily in the country from states north of the Union. Asiatics form less than 3 per cent and are descendants of indentured labor. All are native to South Africa and natural increase is rapid. Lastly, there are Cape Colored, the Bushmen, the half-breed Hottentots, and the Malays of the Cape. Intermarriage makes differentiation difficult. They form 8 per cent of the totals. The low percentage of Asiatics would seem to relegate their "problem" to a minor place, if it were not for the fact that all non-Europeans are often classed as a group and concessions made to one part must eventually be granted to all. That Europeans are outnumbered four to one is the most significant fact in Union social politics. The answer many seek to this is increased immigration of whites.

The real problem in South Africa is the Bantu, the black man of the veld. They come in contact with the white man in almost frightening numbers in the diamond mines about Kimberley, in the gold mines about the Witwatersrand, as house servants among the people of the cities of the Rand, and as agricultural workers mainly in the Transvaal and the Orange Free State. It is in this last area that the agricultural triangle is found where the Boers raise most of their corn, mealies they call it, and their better cattle. In this area the Bantu does all the physical labor, the Boer is merely a supervisor.

#### THE BANTU ON THE BOER FARMS

The Boer takes great pride in his cattle and horses, and with reason. But the uncertainty of rainfall has made him unwilling to work with the soil. He underfertilizes, and he is unwilling or unable to buy machinery. There is a fatalism growing out of climatic catastrophe. I wonder, and I am too unlearned to prove, how insidious is the effect of Bantu labor upon the Boer. That the Bantu does the labor—and not with great efficiency—must be undermining to the industry and ambition of the farm owner. I visited the Glen Agricultural College near Bloemfontein and spoke of their training of farmers. They did not, they said, train farmers but overseers. The Bantu farms. The Bantu is not always efficient in his work. Some Europeans on the veld do their own labor, but not many. The Bantu is, to my way of thinking, a certain detriment to farm economics.

The laborer works from sunrise to sundown six or seven days a

week and there are no holidays. But the laborer is slow at his tasks and loafa a good deal. A nine-hour day probably means six real hours of work. The large size of the farms and the scattered dwellings make for much loss of time going to and from work. As wages are ordinarily fixed, there is little incentive for better work. Where a bonus system is introduced, it often fails because of native apathy. A native will frequently prefer to work for a farmer who pays less if the work is easier. Inefficiency and laziness come partly from the diet of mealie meal and separated milk and occasional rations of meat or stolen cattle. The malnutrition is certainly responsible for much disease, especially tuberculosis. The government subsidizes the export of dairy products and eggs, and yet these are desperately needed at home. Natives are fed better in jails than on the farms.

#### BANTU LABOR IN THE MINES

I have a feeling that in writing about national economics I have at last come to what I know any good Nationalist would call the British problem. In this egocentric age I am sure the British do not consider themselves a problem. It is the barbarians who are problems. In any case it is the British who primarily have developed the mineral resources of the Union. Paul Kruger looked upon gold as a curse and hoped that it would not be discovered. Many a Boer felt the same way. He knew that his quiet evenings in his veld house, with his Bible on his knee, would not survive the greed of a gold rush. Diamonds happened to be found first. But tho the diamond industry has had great value, it has been less important than the gold. Moreover, even considering the relative values of the diamond and gold takes, there have been few Europeans employed and few have shared capitalistically in the returns.

The economics of mining, are dependent upon a cheap black labor. There are almost ten natives for each white man in the mines. This means that except for a few skilled tasks, the whites oversee, while the blacks bend their backs. In gold mining, the European's average wage is some \$2,000 a year whereas the native receives perhaps \$150 a year and his housing and food—for himself but not his family, who remain in a kraal. The natives' economy is a wage plus housing, food, and medical care, less a deduction for traveling expenses. This, even with the alleged native inefficiency taken into account, is cheap labor. One reason for the natives' being herded

into compounds is that there they can be housed and fed more cheaply than if they lived out. Also, the compounds guard their health and make disciplinary problems less difficult. The cost of transport from the kraals to and from the mines varies and in some cases is excessive. Many of the gold workers come from the Transkei reserve south of the Free State. Their travel expenses take from 15 to 20 per cent of their contract earnings. But the South African points out how much better off the native is now than before this industrial imperialism.

No country in the world has a stranger balance to its economy than the Union. Were it not for the great weight of gold in the credit pan of the scales, South Africa would be a backward agricultural community. At least this is true of the veld land. But gold on the Rand, the very heart of the high veld, alters every economic fact. First, it concentrates white population. In the Union there are various ways of looking at vital statistics. It is significant that 45 per cent of the white population lives in nine cities, of which Johannesburg is by far the largest. But Johannesburg does not stand alone. It merely centers the population of the Rand. There are a score of satellite mining cities within thirty miles of the center of Johannesburg which use that city as a banking, marketing, and general service center.

Actually in the Union one-half of the European population obtains its livelihood from gold and gold mining, and in turn, more than one-half the government funds are derived from gold. The industry has greater stability than agriculture. Always, at the lower moisture limits of tillage, the risk of agriculture gain is great. A good year, a bad year, a total failure. On the veld as compared with the sugar plantations about Durban or the fruit area of the Cape, farming is a gamble. But gold, which actually has no value, is given an artificial one and year in and year out is demanded on a world market. The chief buyers are Great Britain and the United States. Much is bought by the United States thru Great Britain. Theoretically, this gold goes to pay for our machine tools, our automobiles and refrigerators and consumers' goods and gadgets which we sell to the Union. Actually, we are encouraging the South African to send his Bantu workers tremendously deep into the earth to dig out gold. We then bury it again in a rather shallow hole we keep for that purpose in Kentucky.

The agricultural Bantu lives peacefully and essentially happy on the farms; most of them live there permanently with their families. They live primitively and they do not cost the Boer land owner but little. The men who work in the mines are a different case. The diamond mines are essentially not being worked today as the world is overstocked with diamonds and they are closed down in order that the price may be kept up. But the gold mines are working at full blast with Bantu doing the unskilled labor. He is forced to leave his reserves because a money economy has been forced upon him thru unjust taxes. He lives in compounds, without his family. The wife stays at home and farms. It is essentially a system of slavery. But the economy of South Africa is based upon gold production. Gold not only pays its way, but pays for the meager agriculture putting it on a sound basis, and it pays for the cost of government. And the gold production is made possible only thru a cheap native labor. The economy of almost slavery must be kept up in order that the country be kept going.

#### CONCLUSION.

The policy of the country towards the native is ideally stated as "one of continual adjustments of the human relations existing between the civilized and the uncivilized in such a manner as will best insure the steady uplift of the uncivilized without detriment to the standards of the civilized." Under the Smuts regime this policy was progressing to an extent. Under the Malan regime there is a reaction. The native is to be held down from any progress. He is to be treated without any consideration characteristic of the twentieth century. To make no steps towards an amelioration of the native policy is in my estimate to head for disaster. On the other hand, South Africa has recently refused the United Nations on a movement towards racial equality. Actually South Africa has not reached a stage where such is possible but it is regretful that they are not taking steps towards some uplift of the Bantu race.

## THE HOP INDUSTRY OF THE PACIFIC COAST

**ELBERT E. MILLER AND RICHARD M. HIGHSMITH, JR.**

University of Utah

Oregon State College

Since the excellent article on "The Hop Industry of the Pacific Coast States" was written twelve years ago by Dr. Otis W. Freeman,<sup>1</sup> some significant changes have taken place in the relative importance of the producing areas, and in the labor supply necessary for the growing and harvesting of hops. The importance of the change is seen in the fact that during the five-year period from 1940 to 1945, the acreage of hops in Washington increased 205 per cent while the acreage in Oregon decreased by 4 per cent. Production in California has increased by one-third. This article is an attempt to give the new location of the industry and to analyze some of the factors which have made the shift necessary. Ninety-eight per cent of the \$40,000,000 worth of hops grown in the United States come from these three states.

Recent additions to our knowledge of the natural requirements of hops have been important in economic production. The hopvine is a long-lived perennial plant usually started by planting cuttings. It grows from six to twenty feet in height by winding itself counter-clockwise around a vertical support. The plant has been found to be much like the tobacco plant in that it is greatly influenced by environmental factors. Alluvial soils or deep, gravelly or sandy loams are best suited for hop culture. Good soils are to be found thruout the areas which are devoted to the growing of hops in all of the Pacific Coast states. Much of the land in the Yakima Valley, Washington, however, tends to be lighter or of less clay content than that in the other producing areas and, therefore, better suited to the growing of hops.

The hop plant is extremely sensitive to sun, wind, heat, rain, insects, and diseases. But, when conditions are favorable, it is not uncommon for the vine to grow twelve inches in twenty-four hours. The plant develops best under temperature conditions without sharp and often repeated fluctuations. The temperature should rise slowly and constantly from early spring up to the middle of summer and then gradually and uniformly recede until fall frosts kill the vine. The plant demands an abundance of soil moisture

<sup>1</sup> *Econ. Geog.*, Vol. 12, April, 1936, pages 155-163.

during late spring and early summer (the period of rapid growth). After growth starts, however, cold spring rains are harmful. Excessive moisture in late August and September leads to severe losses from fungus diseases, moldy cones, and plant lice. Downy mildew has caused great damage in the Willamette Valley yards since it was first observed in 1929. Recently, work has been done to develop varieties which are more resistant to this damage, but severe losses still result during wet years. Some success has been achieved by up to twenty-five applications of copper base fungicide. Control of downy mildew has thus been achieved, but is impractical because rains either prevent spraying and dusting or remove the materials from the plants before they have time to be of value. Growers in the Yakima Valley have had greater success in controlling insect pests than farmers in other areas, possibly because of previous experience with control of fruit orchard pests, and sprays or dusts are not washed off in this semiarid locality.

Without sufficient moisture the plant is unable to pick up copious quantities of plant nutrients and growth is retarded with loss of production. Growers in the Yakima Valley are wholly dependent upon irrigation as a source of moisture for the plants, whereas those in other areas depend on irrigation to a lesser extent. In the Willamette Valley of Oregon, the amount of irrigation is small but is increasing.

Fertilization practices vary widely among farmers in the same districts and among different districts. Some growers advocate the use of compost materials exclusively altho production from most of their fields is nominal. In the past up to fourteen tons of barnyard manures per acre were applied. Some growers are still following this method. Recent developments in the use of winter cover crops have proved to be a valuable practice. These crops, which may be any of the winter grains or Austrian winter peas are planted in the fall after harvest and are disced under about the time of the first training of the hop vines, usually during the latter two weeks of April. The use of commercial mineral fertilizers is increasing, with about eighty pounds of available nitrogen per acre being a common rate of application. These are commonly applied in the form of ammonium sulfate or ammonium nitrate. Increasing use of fertilizers in the last few years is one of the factors in the increased yields.

### MODERN DEVELOPMENTS IN CAPITAL AND LABOR REQUIREMENTS FOR COMMERCIAL HOP YARDS

During the World War II period with the consequent shortage of labor and high prices, the increase in capital requirements for bringing a hop yard into production has been tremendous. It is estimated in the Yakima Valley that about \$700 per acre is now the average cost for labor, plants, wire, poles, twine, etc. In California, estimates range from \$750 to \$1000 per acre for establishing a hop field, exclusive of land costs. The result has been that relatively few new yards have been started except in proven areas and even there the increase has been more in acreage of already existing fields rather than in number of farms.

Changes in the labor requirements have also been drastic. Cultivation is now largely mechanized, but training of the vines to grow on the trellis wires and the cutting of all except two or three vines per hill remain hand operations.

In 1936, harvest costs made up 46 per cent of the cost of production. Prior to the war period, most of the picking of hops was



FIG. 1. Two portable hop pickers in operation. With a crew of eight to ten men, each machine will harvest from 15,000 to 20,000 pounds of hops in ten hours. A 90 per cent reduction in harvest personnel is thus effected, as this poundage would normally require about 100 workers. Lights make night operation possible. (Photograph by courtesy of Yakima Chamber of Commerce)

done by hand and was a rather slow process. Eight men and a portable hop picking machine (Fig. 1) can now do the work that formerly required the efforts of two hundred men. The hop picking machines are of two types: the portable machine which is pulled thru the field, and the stationary machine to which the hops must be hauled. In the first case, two men riding on the front of the machine cut down the hop vines as the picker moves down the row. With the stationary picker the vines must be cut down and hauled to the machine. In the Yakima Valley, at least 98 per cent of the hops are mechanically picked. About half of the yield is harvested with the stationary picker, half with the portable picker. Until 1946, use of mechanical pickers had resulted in a larger amount of foreign matter with the hop cones. At that time, a prominent Yakima grower invented a "jigger" which produces a cleaner product than hand picking, and cleaner than any crop previously produced in the United States. Foreign matter in 6,700 bales of hops tested by the United States Department of Agriculture was 4.96 per cent as compared to 10 per cent in 1945. It is possible that this may be a factor in retaining our markets, even after production is renewed abroad. By terms of a reciprocal trade agreement with Czechoslovakia in 1947, tariff duties on hops selling for 50¢ a pound were reduced from 24¢ per pound to 12¢ per pound, altho protested by the Hop Growers Association.

In the Sacramento area of California, the percentage of hops picked by machine is about the same as it is in the Yakima Valley (98 per cent). In Sonoma and Mendocino counties of Northern Coastal California about 60 per cent is picked by machine, while in the Willamette Valley of Oregon only 25 per cent is harvested by this method. Reason for the differences lies in the size of the individual farms in each area and the income of the farmers. Hop yards in Oregon are generally smaller than those in other areas and because the yield per acre is less, many farmers cannot afford to invest so much money in a machine. The portable pickers cost about \$8,000 while the stationary machines sell for about \$20,000. The stationary machines have several times the capacity of the former, but the trend is toward the use of the cheaper machines. Where hand labor is still used, it is generally migratory. Ordinarily, workers prefer fruit picking, which comes at the same time, because it is cleaner work.

Changes in the curing of hops have been few. These changes have been in the shift to oil as a source of heat and the increasing

use of fans and forced circulation of the warm air used in curing. The result is faster and more uniform cooling with less loss from scorching or undercuring. More rapid curing at less cost also results, the air need not be heated to such high temperatures, and a kiln can handle more hops than with natural draft kilns. Regions in which the air has a low humidity during September make for cheaper and faster drying. The Yakima Valley has a distinct advantage in this respect. After curing, the hops are stored for one to three weeks, then pressed and wrapped in burlap for shipping.

#### USES OF THE HOPS

Technically, the hop plant is grown for its cones (hops) containing lupulin, consisting of resins and essential oils, which impart the characteristic flavor to beer, ale, and other malt beverages. The essential oil also contributes to the keeping qualities and aroma of beverages and the tannins occurring in the scales of the hop cone or strobile aid in the clarification of the brew after boiling.

Only a very small amount of dried cones is needed in the making of beverages. Thus in the United States, each thirty-one gallon barrel of beer requires the addition of about a half pound of hops. In foreign countries the amount used may be up to one and a quarter pounds per barrel. According to the former figure, about 42,000,000 pounds of hops would be consumed in the United States per year by the breweries which represent approximately 98 per cent of the total usage. Other uses include the flavoring of foods, cereals, base for pills, yeast, and fixative for dyes. Brewing companies disagree as to the quality of hops produced in the different states, some having preference for hops from one state, others prefer hops from other states and some make no preference. Some find greater variation from the same area from season-to-season than the variation among different areas. Breweries vary considerably also in the amount of European hops purchased (in the pre-war period). Some breweries use no European hops, others used up to 30 per cent from Europe. Since the war, United States hops have been exported to Europe, but production there has been increased almost to the point of self-sufficiency.

#### PRODUCING AREAS

Three major hop producing areas are to be found in the West Coast States. (See maps.) These are the Yakima Valley of South

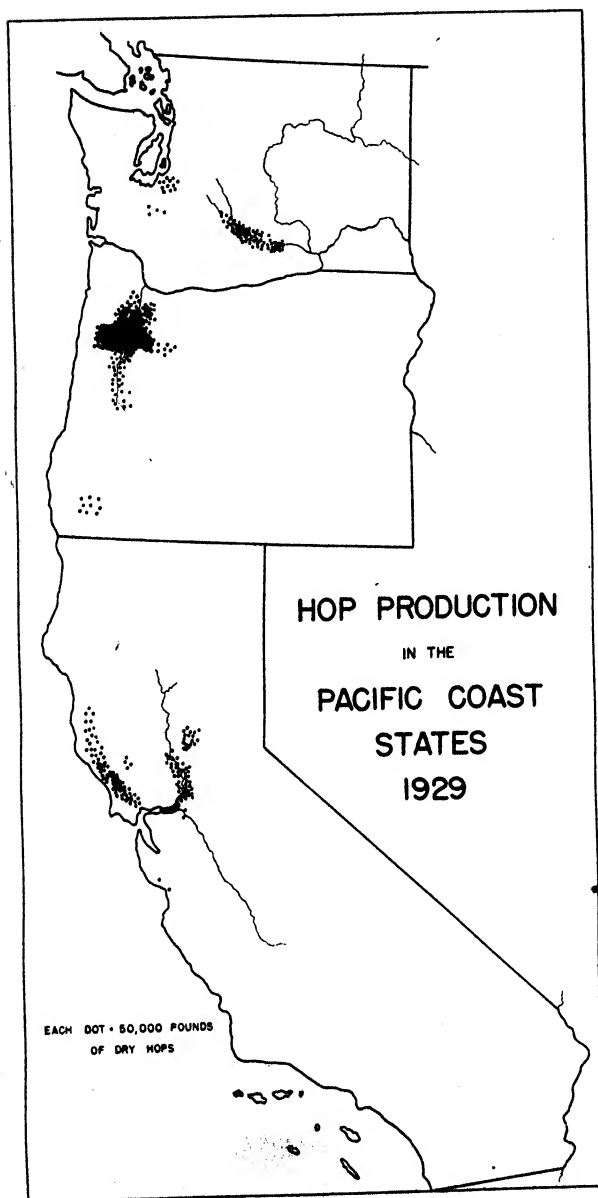


FIG. 2.

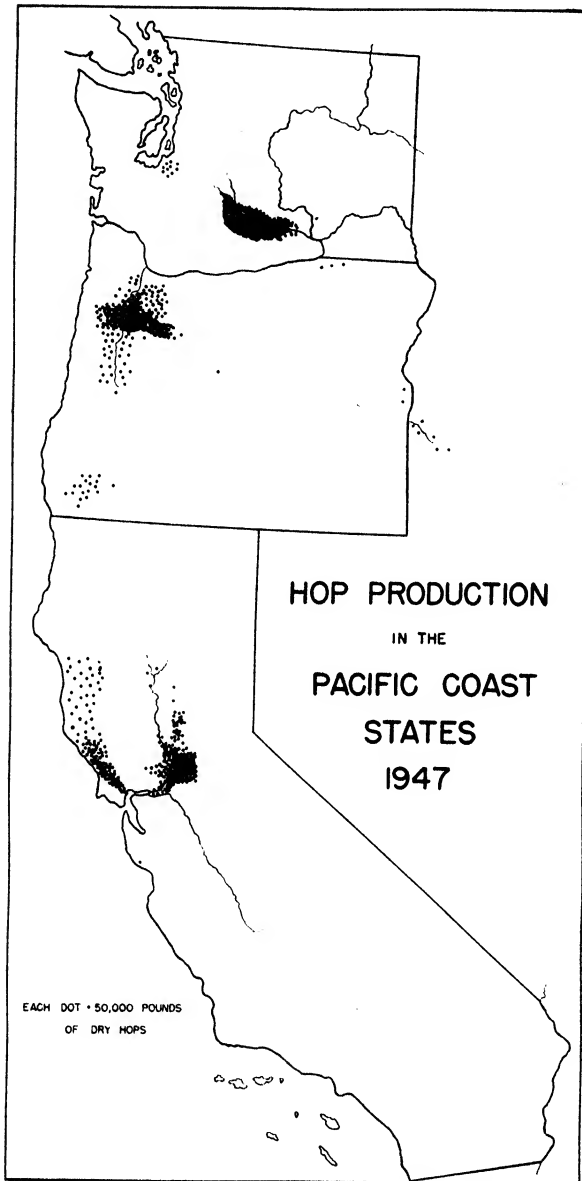


FIG. 3.

Central Washington, the Willamette Valley of Western Oregon, and the central part of California. Minor producing areas of the United States include the Snake River Valley of Idaho, the Puget Sound Lowland near Tacoma, Washington, scattered areas in Eastern Oregon, and parts of Central New York. The Yakima Valley region is the most important of these areas and is the one

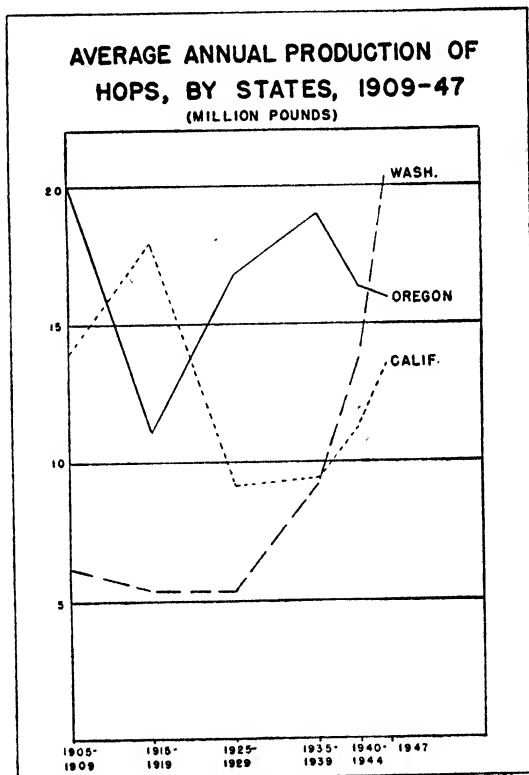


FIG. 4.

which has been showing the most rapid growth in recent years (see table of statistics).

In the Yakima Valley, most of the hops are concentrated in four districts: around Moxee City, a few miles east of the city of Yakima; the Tampico district about twenty-five miles west of Yakima; the Indian Reservation-Mabton district about thirty miles south of the city of Yakima; and the Sunnyside-Prosser district about fifty miles southeast of Yakima. The first two are older but the latter two have the largest yards, some up to 1,000 acres in size. About one-third of the crop is produced under the guidance

of the Washington State Hop Grower's Association organized in 1937. A standard quality for the crop and numerous publications and advice on the factors of growing and marketing hops make the cooperative successful.

The valley of the Willamette River in Western Oregon is the second most important producing area. Hops occupy the present floodplain thruout the length of the river valley on Newberg and Chehalis soils. These are the best soils of the lowlands but are relatively heavy. The greatest concentration of yards is to be found immediately west of Salem. In addition, there are many small yards scattered thru the lower foothills of the valley side of the Coast Ranges. These are mainly on the Olympic series of soils formed from the breakdown of lava, which are the better hill soils. These yards are usually the lowest producing in Oregon. The acreage of hops in Oregon is 62 per cent more than that of Washington but the production is 26 per cent less, due to lower per acre yields (Fig. 4).

The hop land of California is found in the southern part of the Sacramento River Valley and along the coast north of San Francisco. The alluvial soils at the confluence of the Sacramento and American rivers and of the Yuba and Feather rivers are areas of heavy concentration. A very small amount is grown south of San Francisco in Santa Cruz County. However, the heat received from the summer sun is too great as one goes south of this area. Wide variations in practices, yields, and diseases are to be seen in the producing areas. In general, the Sacramento Valley areas follow practices similar to those of Eastern Washington and Oregon while the coastal areas are similar to those of the Willamette Valley. Irrigation is common in interior fields; seldom seen in coastal hopyards. Yields are high in the Sacramento Valley area; lower in the coastal districts. Seeded hops are grown in the coastal districts, but seedless cones are more common in the interior.

Other areas which produce hops are found in the Puget Sound Lowland near Tacoma, Washington, where practices, yields, varieties, diseases, etc., are similar to those of the Willamette Valley. The Snake River Valley of Idaho produces a small amount of hops near Twin Falls using irrigation as a source of water. The arid conditions are typical of the Yakima Valley hop yards. Eastern Oregon has a number of small districts which produce hops most of which are only a few tens of acres in extent. Moisture is supplied by irrigation and while these districts are in Oregon they

are more typical of the Yakima Valley farms than of the western Oregon hop yards. These are the only parts of Oregon where planting is exceeding the acreage plowed each year. Southwestern Oregon has a small acreage along the Rogue River, where conditions are similar to those along the Willamette River. New York, formerly an important producer, steadily declined until 1940 and is now a very minor producing area. Poor climatic conditions such as sharp variations in temperature and cold rains make this area unsuited to the production of hops. The following table shows acreage, production, and yield in 1947. Indications are that the production was about the same in 1948, but the acreage was slightly larger.

<i>State</i>	<i>1947 Acreage</i>	<i>1947 Production in Pounds</i>	<i>Average Yield Per Acre</i>
California	9,017	13,590,000	1,507
Coastal Calif.	3,929	5,300,000	1,425
Sacramento Valley	5,000	8,300,000	1,660
Oregon	19,185	16,045,200	836
Willamette Valley	17,210	13,551,200	787
Eastern Oregon	309	540,500	1,102
S. Western Oregon	1,666	2,153,500	1,292
Washington	11,894	20,402,000	1,715
Yakima Valley	11,537	19,892,000	1,724
Western Washington	357	510,000	1,429
Idaho	245	390,700	1,595
New York	300	215,600	719
Total United States	40,641	50,653,500	

#### FACTORS IN THE VARIATION IN YIELDS OF HOP YARDS

It is difficult to assign relative values to the many factors involved which give the Willamette Valley hop yards smaller per acre yield than other areas. The average yield in California is only slightly less than that of South Central Washington. Many interrelated elements must be analyzed to obtain the total picture. Of great importance are the physical factors of soil and climate. In the hop growing regions of Western Oregon, the coastal parts of California, and the Puget Sound Lowland of Washington, hops commonly occupy soils which are not particularly adapted to their needs. They may be heavy, difficult to work, of rather high clay content, and have a dense, compact subsoil. Sandy to gravelly loam is practically demanded by the deep rooted hop vine if optimum growth is to be received. Soils occupied by hops in Yakima and Benton counties are of the Sagemoor Series and are the best

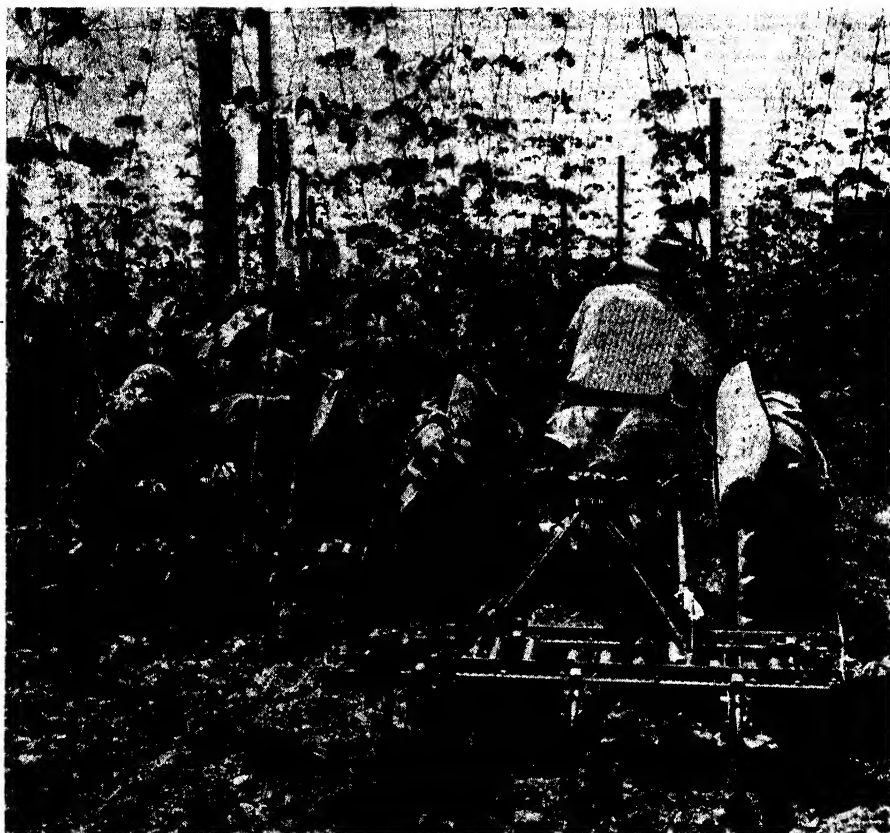


FIG. 5. Cultivating one of the hop yards in the Yakima Valley. Note the depth at which these small tractors can pull the implements. This indicates the light, sandy character of the soil. The vines have reached the tops of the twenty-foot trellises by this date, approximately May 1. (Photograph by courtesy of Yakima Chamber of Commerce)

in the valley from the standpoint of texture, fertility, drainage, and slope (Fig. 5). Thus, the Yakima Valley hop plant is better cared for from the ground up.

Climatic conditions in South Central Washington and the Central Valley of California are also favorable not only for plant growth but for the prevention of yield reducing diseases and plant insects. Most important of these are plant lice and downy mildew which causes serious losses in some areas during cool wet years. Cool temperatures and humid conditions favor the spread of downy mildew and are major reasons why the Willamette Valley has a greater incidence of this disease than other areas. On the other hand, the hot, dry summers of South Central Washington

prevent the formation of downy mildew, and the cold, dry winters help to prevent the increase of destructive insects. Moisture requirements of the hop vine during the spring and early summer are exacting and are met in the Yakima Valley by irrigation. Some growers of the Willamette Valley practice irrigation, but the number is not large. Besides this, the type of irrigation used in the Willamette Valley seems least fitted to the humid conditions found there. Altho it is true that the summers are dry, nevertheless, the humidity is greater here than in the interior regions. In the interior areas of both Washington and Oregon, ditch irrigation is more commonly used, while in the coastal region, sprinkling is common. The use is directly related to the fact that undulating land is more commonly planted to hops in the coastal regions while gently sloping lands are used in the interior. It is also related to the time at which irrigation was first practiced in the region. Sprinkling is a relatively new method of field irrigation, and the use of supplemental water as a crop aid is a recent innovation in these humid regions. Most of the yards in the Willamette Valley were established before the practice of irrigation was begun, so few fields are leveled. Sprinkler irrigation in moist regions has a tendency to further the spread of downy mildew, particularly if growers are careless and irrigate on cool, cloudy days, because it increases humidity within a small area. Irrigation also makes heavier fertilization possible because plants can take up larger amounts of plant nutrients without being "burned up." The fertilizers are diluted by large quantities of water to a strength the plant can withstand. This, of course, makes more rapid and vigorous growth of the hop vines and therefore greater production. Farmers vary widely in the amount and kind of fertilizer that they use. In areas of low production and high possibility of loss from disease, farmers are loath to spend large amounts of money for fertilizer. The result is a lowered yield.

Other factors in the increased yield of some areas are related to planting. Because of warm early-spring temperatures, the lack of cold rains, and the benefits derived from irrigation in South Central Washington and parts of California, hop vines may be set out so early and grow so rapidly as to yield a moderate crop the first year. The Sick's Brewery Enterprise Yard at Sunnyside, Washington, reported that it harvested 2,020 pounds per acre during the first year from thirty-six acres planted to hops in

1947. In Oregon yards, frequently no crop is obtained the first year and only a partial crop the second. This adds to the expense of establishing the hop yards and decreases the average yield for the state. This factor of production during the first year is extremely important when we consider that about 2,000 acres of hops were planted in the Yakima Valley in 1947 and about 1,150 acres in 1948.

The spacing of plants in the row is another planting factor which has a diverse effect on yields. Differences are found from field to field in the distances between the rows and between the plants within the row. Seven by seven feet is the usual spacing in irrigated fields, altho "double planting" (three and a half feet in the row) is sometimes practiced, especially in California. In areas which depend upon rainfall, eight by eight feet planting is more common. Thus there is a loss of about 240 plants (or 25 per cent) per acre resulting in a lowered yield.

Human and economic factors also have an important effect on yields. With low yields and great possibilities of loss from diseases and parasites, the Willamette Valley farmer often hesitates to spend money and labor on field practices which may not show a profit. The small size of the average hop yard often makes it impossible to buy the latest equipment and follow the latest methods. In 1947, about 65 per cent of the Willamette Valley hop yards contained less than twenty-five acres and 85 per cent contained less than fifty acres. In the Willamette Valley a small hop yard is frequently a phase of diversification on a larger farm. Thus it doesn't receive the grower's full attention. On the other hand the growers in the Yakima Valley and Sacramento Valley are generally specializing in hop production. (Fig. 6)

Oregon growers frequently receive lower prices per pound for hops grown than do farmers of other areas. This is mainly due to two factors. First, poorer quality of the hops due to lack of equipment for recleaning and lack of modern kiln driers with consequent uneven curing. Secondly, and more important, the practice of growing "seeded hops." The hop plant may be either male or female. If only female plants are grown in the yard, the cones remain unfertilized and seeds do not develop within the "hops" or cones. Hops which contain seeds weigh more, but have a higher tannin content and are less valuable for brewing. For this reason, prices for seedless hops were 75¢ per pound (cured weight) while

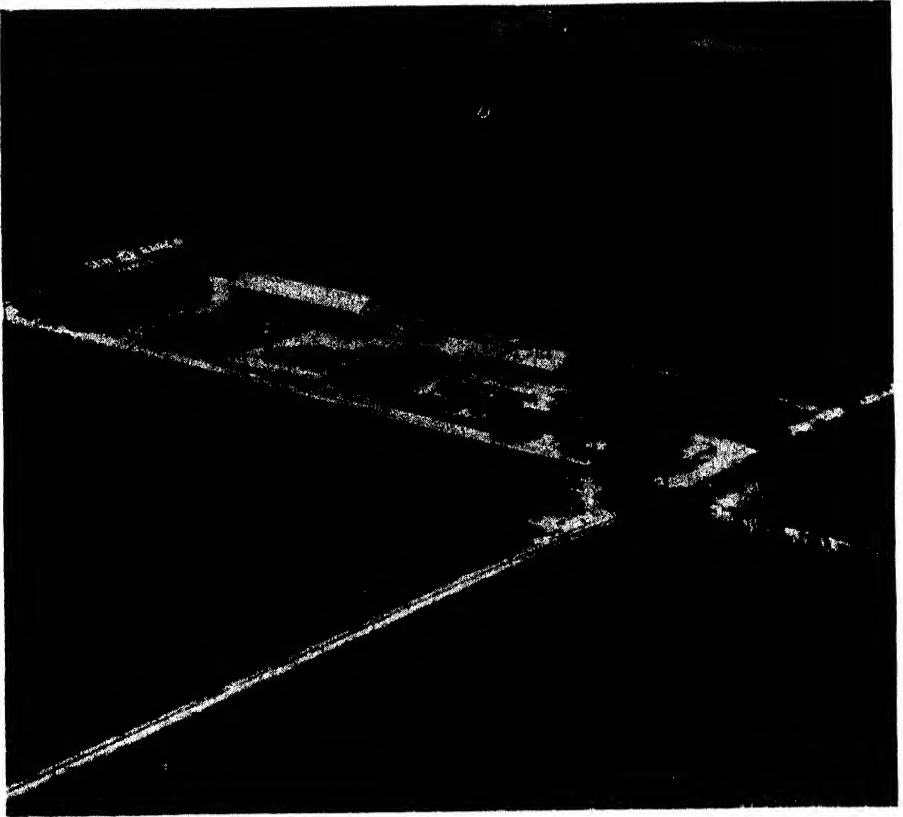


FIG. 6. One of the large hop-farms in the Yakima Valley. The light-colored area in the background has been harvested. The large building at the left is the drying shed. Note fan vents in the roof. (Photograph by courtesy of Yakima Chamber of Commerce)

seeded hops were selling for 65¢ per pound during the fall of 1947. In 1947, about 72 per cent of the hops grown in Washington showed less than 6 per cent seeds while 65 per cent of the California crop and only 15 per cent of the Oregon crop showed the same degree of purity. Because of the already low yield per acre, the Oregon grower hesitates to decrease the weight of the crop still further by growing seedless hops. These factors of yield and price made it possible for the Yakima Valley or Sacramento Valley grower to gross about \$750 per acre more than the Willamette Valley grower.

#### CONCLUSIONS AND SUMMARY

What picture of the possible future of the growing of hops in the Pacific Coast States do these facts give us? What are the

chances of these states to maintain production at present levels? Any one of them could supply the market needs of the breweries of the United States provided it would plant all of the suitable area in hops. Therefore, the hop grower must be continually careful to keep his costs within the lowest possible range and to produce the largest yields so his cost per pound will be as low as possible. Few farm enterprises show such a high percentage of cash cost as does hop growing. For this reason and because the European markets will undoubtedly soon be lost to the United States, the hop growers should be very careful not to overplant. Each farmer must keep an accurate accounting of his costs and if they are high, he will have to change his methods or turn to some other type of farming. The amount of hops used per barrel of beer is gradually decreasing in the United States. Thus we shall see a gradual decrease in the acreage of hops within the areas with a low yield and a gradual increase or maintenance of present acreage in places where hops can be grown at low cost. Beer consumption tends to rise and fall with national income; from 1940 to 1945, it rose from 13 to 19 gallons per capita, almost 50 per cent. Unless consumer purchasing power is maintained close to its wartime level, per capita beer consumption is likely to decline.

The factors of climate, soils, irrigation, distance of planting, yield during the first year, diseases and insect pests, variety, use of fertilizer, methods of harvesting and curing, and size of farms, all conjure to make it more difficult for the Willamette Valley farmer to compete with the California or Yakima Valley hop growers. The process that has been going on for the past ten years of decreasing production in the coastal areas will undoubtedly continue. If untaxed imports from foreign countries are allowed or if there is another period of depression, the high-cost, low-yielding farms of these coastal areas will find it increasingly difficult to continue to compete with the high-yield, low-cost areas of the interior and will undoubtedly discontinue producing hops.

## MEXICAN MERCADOS

MINNIE B. TRACEY

Drake University, Des Moines, Iowa

### FUNCTION OF THE MERCADO

The Mexican mercado is the counterpart of the American farmers' market or the municipal market. In general, there is a central building in which are housed some of the more perishable items, and from this stems the market itself, its various ramifications protected from the sun and the elements by canvas topping. In the city, the market may extend for several blocks, lining both sides of the street. To get a full view of what is being offered, one walks down the middle of the street. In the village, the market is a miniature of the city one, but it is ever present.

In the United States, the farmer brings in his surplus produce and rents a stall from which to dispose of it. At the same time, regular merchants may have counters from which they sell meats, fruits, flowers and potted plants, and other items similar to those they sell in their regular establishments. The situation may be similar in the Mexican market, there being a great diversity of goods offered, many of them manufactured goods.

Selling here is likely to be a family affair, the mother caring for her small children while she sells—with the cat or the dog much in evidence. A certain amount of "socializing" among neighbors and friends is inevitable, altho the market is quite definitely a means of disposing of surplus or of articles produced expressly for sale.

It is here that the masses of the people do their shopping. While there are department stores and specialty shops in the towns or cities, these tend to carry merchandise of greater quality appeal, goods which the lower income groups cannot afford. The mercado on the other hand, carries practically everything that the average Mexican homemaker would use.

### DEPARTMENTALIZATION

The mercado is rather loosely departmentized. Ordinarily there may be found the following departments: (1) foods—fresh fruits, fresh vegetables, meats, fish, poultry, food preparation and restaurants; (2) flowers; (3) basketry and/or pottery; (4) clothing—blouses, house or street dresses, children's wear, shoes; (5)

miscellaneous items—jewelry, combs, household utensils, hardware, even some plumbing fixtures and furniture.

### PRODUCTS SOLD

What amazes one in this land of both riches and poverty and need, is the abundance of foods and other items found in the markets. It is distressing to see the vast quantities of over-ripe bananas and other fruits, knowing that so many families have too few pesos to make possible quantity purchases. Many of the Mexicans, however, may not be too unhappy over this aspect of their plight. Tradition binds the country folks largely to a diet of tortillas, frijoles, and chili, even in the fruit and vegetable producing regions—highly nutritious according to the dietitians. Nevertheless, the large city markets offer fruits and vegetables in great variety. Among them may be seen many greens, many types of chili, several types of dried beans, string beans, carrots, radishes—some of enormous size—garlic, tomatoes, beets, peas, avocados, cabbage, potatoes, tuna (fruit of a cactus plant), apples, strawberries, pineapple, bananas, grapes, mangoes, pomegranates, coconuts, melons. Most of these are Mexican grown, but in the city some of the crates bear United States labels.



FIG. 1. Market in Acapulco.

Flower markets are sometimes separate, occupying stalls on a different street as in Guadalajara, for example. They may be entirely separate, as the funeral wreath and some of the other flower markets in Mexico City, or they may occupy a department in the

general market. In any case, the flowers are varied, profuse, and beautiful—as well as very inexpensive according to our standards. It is possible to buy a lovely corsage for as little as one peso—roses for three cents in our money. .

In the various clothing departments are to be found, for the most part, items for the working man or dresses for the woman in the home. Usually there are also blouses brought in from the surrounding villages. These are hand made, some of them lavishly embroidered. These, as well as the dresses, are not particularly well fitted to the American figure and in the summer of 1948 the new lengths in dresses had not yet invaded these markets. Aprons and other hand-made articles are equally attractive and relatively inexpensive. Altho an apron in the Mexico City markets might cost as much as six pesos, a beautiful apron trimmed with crocheted medallions might be purchased in the Guadalajara market for as little as three pesos. Children's clothing, especially that for little girls, is very attractive and very reasonable in price.

#### GEOGRAPHIC INFLUENCE ON OFFERINGS

The specialties of the markets are largely dependent upon two factors—the geography of the region and the character of the trade. Altho food products of many types may be transported to the large city markets, other items tend to be characteristic of the region. There is much pottery in Taxco, Xochimilco, and Uruapan, and very much in Guadalajara. The Cuernavaca market has a scarcity of dresses, blouses, and flowers. Toluca, being west of Mexico City, has few tropical fruits. Lacquer ware appears in the market in Uruapan; however, it is of a grade inferior to that to be found in the shops in that city. Yard goods is greatly in evidence in many of the markets, particularly in Toluca and Guadalajara, where there are few ready-made garments.

#### TOURIST INFLUENCE ON MARKETS

The type of customer exerts much influence on the items offered for sale. Whether the market caters to tourists largely or whether it sells articles mainly for home consumption has much bearing both on the goods offered and on the sales tactics employed. Absence of bright serapes, baskets, blouses and jackets leads to the observation that the markets in the little towns and villages and in the non-tourist centers like Jalapa are maintained mainly for the benefit of the local residents.

Toluca, a world-famous tourist market, has a whole department devoted to baskets and basketry. It has many lace doilies and much drawn work, hand-embroidered jackets, blouses, aprons, dresses and baby dresses. Vendors here are most persistent. They greet the tourist as he descends from the bus or car, present their



FIG. 2. Part of Toluca market.

baskets or purses and refuse to take "No quiero" for an answer.

Often the mercado itself emphasizes goods for home consumption while the arcade markets surrounding the zocalo or central plaza of the town strive avidly for tourist trade. Vendors literally pursue their prospects, note whether or not they buy, and approach them again at next sight. In Puebla, while the writer was dining in a hotel restaurant, a vendor who had thus "become acquainted" stood outside the window waving a lovely maguey-fiber table cloth up and down, much to her amusement. He thus attracted attention and created interest. A meeting outside might have aroused desire and resulted in a purchase. However, he failed to clinch this sale. At the end of the meal our erstwhile salesman was not waiting without; rather he was slumped down in front of his stall in the typical sleeping-man position indulging in his afternoon siesta.

While vendors in the general markets, since their wares are sold largely for home consumption, may not be so insistent upon making sales, those in the arcades and along the streets are quite the opposite in their approach. They are accustomed to meeting

tourists and thus find themselves in the position of the one-stop salesman. It is a case of selling to that customer now or not at all; hence every effort is bent toward effecting a sale, even to the extent of annoying the prospect.

#### ATMOSPHERE

The atmosphere of all of the markets is colorful and interesting. The odor is difficult to describe; it is an intermingling of smells of vegetables and fruits, tropical and non-tropical, usually pervaded by the sickly-sweet scent of the lime. Move toward the fish or meat department, however, and this is dissipated by their more characteristic and less agreeable odors. Meats are strung up in unrecognizable cuts, almost always without benefit of refrigeration. Sliced pineapple may be sold from a block in a would-be aisle with its full complement of flies or even of bees.

Look in vain for bobby pins in the stores, only to find them on the miscellaneous counter in the market—in the bulk. Buy your toothbrush here all exposed to the elements. Now make way for someone coming thru with an armful of chickens, then for someone else with turkeys. Or stop to look at the sandal-clad Indians with their panchos or rebozos and wide straw hats. If they have purchased a new hat today, the new one will be atop the old one. Notice the life-sized straw man modeling workmen's apparel.

Peep into the kettles of soup or chicken or watch the tortillas frying over a charcoal blaze—to be eaten in the hole-in-the-wall restaurant conducted in connection with the market. And do not fail to see the dogs, cats, and chickens roaming among the foods and dry goods. See, too, that the crowd moves on, paying scant attention to the rare refrigerator case of pasteurized butter and cheese, or to the oddity of a fly-netted fruit display.

#### THE MERCADO AS A MARKETING INSTITUTION

The mercado, whether it be the great San Juan or Lagunella market in Mexico City or whether it be the market place in the most remote village, is a well-established and permanent marketing institution. It is the department store of the common people. It also serves the more fortunate classes so far as some departments are concerned. Usually one or two days a week are designated as market days, at which time the housewife may stock up for several days. On these days the markets are crowded, as are our farmers' markets on their particular days, with people buying everything from food to plumbing fixtures.

## WESTERN GERMANY

ADOLPH STONE

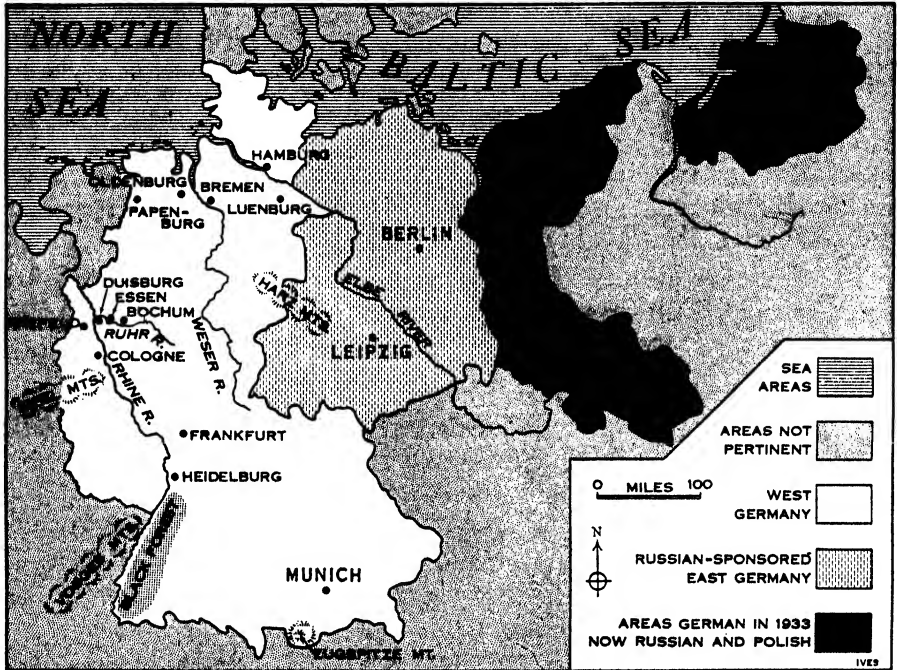
Long Beach City College

A new member of the family of nations, as the name already indicates, covers the western 100,000 square miles of the original 180,000 square miles of German land. While this is only about two-thirds of California, it is still a respectable size for European conditions (Great Britain has only 93,000 square miles). And in population the new "Reich" will probably out-number again all other European countries, but not by the wide margin of prewar days. By counting all repatriates (Western) Germany will have near to 50 million people compared with 64 million before the war, 42 million Frenchmen, 47 million Englishmen and 24 million Poles. With the exception of Berlin, the now divided capital, and of Leipzig, a probable center of an Eastern Germany, all large cities of the prewar Reich are in the western part, such as Hamburg, Munich, Cologne, Essen, Frankfurt, and others. This makes Western Germany a strongly urbanized state with a population density of almost 500 people to a square mile. With this equation—people versus area—in mind, the geographer should reevaluate the geographic picture.

Munich, Germany's most southern city, has the same latitude as our most northern Seattle ( $48^{\circ}\text{N.}$ ). The climate of Western Germany is mild. The marine influence from the North Sea penetrates the country all the way to the eastern and the southern boundaries, the fringes of the Alps. In contrast the climatically less favorable "hinterland" of the Baltic Sea remains in the Russian zone of influence. With almost nine months growing season, with an average of  $65^{\circ}$  to  $70^{\circ}$  in summer and with  $10^{\circ}$  to  $20^{\circ}$  in winter, with sufficient humidity to make irrigation unknown (30 to 40 inches of rain), without strong storms or floods, Western Germany's climate is stimulating and explanatory of much of the energy shown by the peoples of that area thruout history. Some professional men will compare Oregon's climate with it, yet I have actually not found any one area in the United States, which climatically compares with Central Europe.

In contrast to the good climate Western Germany's soils are somewhat less than mediocre. In its northern part, as the result of glaciation, there are extensive sandy areas, large stretches of heath around Lueneburg and marshes extending from Papenburg to Oldenburg (where much concentration camp labor was employed

in drainage projects). The center of the new country shows the irregular pattern of low uplands, from the Harz to the Eifel, cut up by the systems of three big rivers, Elbe, Weser, Rhine, and the south gradually rises to the heights of the Bavarian Alps (Zugspitze, 9700 feet). The Rhine valley is paralleled by highlands on both sides—Vosges and Black Forest—which makes it the land of



romantic scenery, famous with wine and song (Heidelberg, Ruedesheim, etc.). The overall picture for Western Germany's agriculture is not very bright. Prewar Germany, as is well known, reached almost self sufficiency in food production only with much cultivation, fertilization, regulation, all of which was high cost farming needing government help. The working population therefore depended largely on staples, such as rye and potatoes, which came from the estates of the Junkers in the cooler Eastern Germany, now taken over by Russia and by Poland. If Western Germany cannot restore the traditional exchange of East German farm products for its industrial goods, it will have to turn to its western neighbors. The result could be war diminishing interdependence, the basic idea of the Marshall plan. While rye, as already mentioned, is mostly grown in the short summer areas of the eastern part of the country on large farms, Western Germany has almost exclusively

small farms broken up into wheat, barley, beet and feed patches with some dairy and some meat animals.

The supplementary fishing is strongly curtailed by the lack of vessels and the lumber or steel with which to build them. Large cultivated forests, one-fourth of the land area, were decimated for army use during the war, and for fuel for a freezing population by the occupation authorities right after the war.

Western Germany's industrial assets, more than anything else, seem to be the reason for the speedy creation of the new state. Correctly it has been stated that Europe cannot recuperate without the German coal and steel. Half of Europe's coal and even more than half of the coking coal, so important for steel production comes from the Ruhr mines (Essen, Krefeld, Duisburg, Bochum, etc.). Two other former German mining areas, Silesia with coal, and Saxonia-Thuringia with lignite, are now Polish and Eastern German respectively. With almost 90 per cent of the prewar coal reserves left in Western Germany, with rich potash deposits and with some low-grade iron mined along the Rhine and in the central uplands, but minus all other mineral wealth, the new state will have to struggle to reach prewar figures in the production of pig iron, raw steel, chemicals, textiles, motor vehicles, appliances, etc. Since almost 50 million out of 64 million Germans choose to live in Western Germany, the employment problem will be most difficult. Future industrial development will depend on the skill of German workers, especially miners and on other factors such as markets and transportation.

Western Germany has an excellent river-net especially in the Rhine and its tributaries of which one is the Ruhr. Many canals connect the rivers. Roads, like the Autobahnen, and railroads are also good except for war damages which are being repaired. Bremen and Hamburg are world renowned harbors, second only to New York and London. Rolling stock and even more so water carriers are badly depleted as a result of the war. Another severe handicap is the Iron Curtain cutting thru German land, roads, railroads, rivers, and forming the new state's eastern boundary, while the western boundary, in all probability, will be the old German frontier. On the asset side again is the loss of much Prussianism. A map comparison of this youngest Reich with the medieval, pre-Hohenzollern (first) Reich will show surprising similarities.

Whatever our feelings might be, in the interest of peace we must wish the newest member of the family of nations well.

## THE NATIONAL COUNCIL AT WORK

Two committees of the National Council of Geography Teachers have recently sent letters to all of the State Coordinators, the State Superintendents of Public Instruction, to many geographers and geography departments, and to school officials in all parts of the United States.

The Committee on the Promotion of Field and Travel Experiences for Teachers has (1) organized a tentative list of aids toward travel and study experience, (2) divided responsibilities among themselves as to work on (a) field experiences, (b) travel and teacher exchange, and (c) hospitality for foreign geographers, (3) prepared materials relating to travel and field trips, and (4) conducted a sectional meeting on Field Experiences at the 1948 meeting of the National Council in Chicago. The committee distributed material to the State Coordinators at the Cleveland meeting in 1949. Members of the committee have consulted in Washington with the United States Office of Education, the National Education Association, the State Department and the Pan-American Union. Contacts with visiting foreign geographers have been made thru UNESCO and the Institute of International Education.

A letter, listing some fifteen geography field trips scheduled by colleges and universities for the summer of 1950, was mailed to two hundred educators on January 10. *The committee chairman asks all geography departments to send her announcements of 1950 field trips as soon as possible.* Educational travel has become so well accepted that N.E.A. has scheduled a special series of meetings relating to this field at the forthcoming Atlantic City meeting in February, 1950. This active committee of the National Council consists of Pauline P. Schwartz, New Haven State Teachers College, New Haven, Connecticut, *Chairman*, Adah Flemington, New Trier High School, Winnetka, Illinois, Paul H. Kensel, Travel Service, National Education Association, Washington, D.C., G. Etzel Percy, Transworld Airlines, and A. W. Watterson, Illinois State Normal University, Bloomington.

The Committee on Compilation of Suggestions and Bibliography for Use by Curriculum Committees mailed letters on January 5 to all state superintendents. This committee is gathering the lists of State Courses of Study and State Bulletins, and preparing a bibliography of articles pertaining to curriculums in geography. Each superintendent was notified of the name of the NCGT State Coordinator in his state, and later more detailed work will be carried on thru the Coordinator. The Committee has completed work on an annotated bibliography of articles dealing with geography curriculums that were published in the JOURNAL OF GEOGRAPHY during the period 1939-1949. This bibliography is divided into sections on the elementary grades, Junior High School, and Senior High School. The members of the committee are Mamie L. Anderzhon, Oak Park Public Schools, Illinois, *Chairman*, Mrs. Annice D. Elkins, Supervisor of Instruction, Osceola County, Kissimmee, Florida, Monica Kush, University of Illinois (Navy Pier School, Chicago), and Villa B. Smith, John Jay High School, Cleveland, Ohio.

LOYAL DURAND, JR.  
President

## EDITORIAL NOTES AND NEWS

In 1946, the NCGT initiated a Contributing Membership, a class of membership in which there has been a steady growth with every passing year. Contributing Memberships are renewable annually. Dues are ten dollars. This sum includes the regular membership dues and the JOURNAL OF GEOGRAPHY, with the remainder of the money going into the publication and general funds.

It is by the continued building up of this type of membership that NCGT can make further progress. This group can never grow too large in numbers. Add your support to the furthering of geographic education.

The 1949 list of Contributing Members were:

Olga Anderson	Wilma Gronstal	Sidman P. Poole
Mamie L. Anderzhon	Gilbert H. Grosvenor	M. Catherine Roberts
Wallace W. Atwood, Sr.*	Edna Gueffroy	Ina C. Robertson
Thomas F. Barton	Halene Hatcher	Ruth M. Schnieder
Hermine K. Bauschard	Clara Hinze	Edith R. Shannon
William J. Berry	Emilie Huck	Earl B. Shaw
G. P. Bhawe, Esq. (India)	Preston E. James	Cora P. Sletten
Norman Carls	Carl H. Johnson	Guy-Harold Smith
Bernice M. Casper	Clarence F. Jones	Clarence W. Sorensen
Rose B. Clark	Mario A. Jordan (Cuba)	Cyril L. Stout
George B. Cressey	Lois R. Keller	M. Melvina Svec
Floyd F. Cunningham	Homer E. Knight	Mary B. Taugher
Emil O. Deere	David G. Koch	Zoe A. Thralls
Ethel Y. Eachus	Clyde F. Kohn	Arthur G. Tillman
Emma Ehlers	Katherine J. Lang	Ellen D. Tollman
Elizabeth Eiselen	Anna C. Larson	Eugene Van Cleef
Annice Davis Elkins	Minnie E. Lemaire	Etelka Holt Vincent
Grace Ewy	Ben F. Lemert	Stephen S. Visher
Mary Louise Fagg	Harland J. Lewis	Anna Wellnitz
Olive C. Fish	Joseph T. Maddox	Gertrude Whipple
Adah Flemington	Carl H. Mapes	Katheryne T. Whittemore
John H. Garland	W. R. McConnell	Ruth Wood
Marie E. Geilen	Alfred H. Meyer	Lillian Worley
O. E. Geppert	Charlotte M. Noteboom	Rose Zeller
Anne M. Goebel	Edith P. Parker	Norah E. Zink
	Margaret T. Parker	

\* Deceased

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Into how many major phases would you divide the experimental work since 1900 on the problem of teaching geography in the United States. Professor N. V. Scarfe recognizes that in the British Isles since 1900 three major phases of experimental work exist. The three are: 1) "It was not until 1919 that controlled experiments were made with follow-up tests;" 2) "The second phase of experimental work which developed mainly after 1920 was that of investigation into scientific geographical abilities and achievement;" and 3) "The third phase of inquiry which definitely shifts the emphasis from the subject of geography to the children who learn it." Have similar phases occurred in the United States? Has anyone made a study of the subject? These three phases are briefly discussed by Professor Scarfe in one of his recent articles "The Teaching of Geography in Schools" in the June, 1949 issue of *Geography*.

## GEOGRAPHICAL PUBLICATIONS

O. G. S. Crawford. *Topography of Roman Scotland*. 162 pages, 32 figures and 21 plates. Cambridge University Press. 1949. \$6.50.

W. Gordon East. *An Historical Geography of Europe*. 480 pages and 58 maps. Dutton. 3rd edition, 1948. \$6.50.

*Topography of Roman Scotland* is concerned with Roman camps, forts and roads in northern Scotland, whereas *An Historical Geography of Europe* is wide-ranging in geographic and historic scope.

This detailed study of the present-day evidences of Roman camps and roads is based on field work and ingenious use of air photographs. It is essentially a guide book for the traveler of historical interests. Preceding the mile-by-mile traverses is a discussion of the types of evidence to be met and of methods of identification.

Professor East's outline of the historical geography of Europe omits Scotland, along with the rest of the British Isles, but does emphasize the Roman Empire. In fact the first part of his book is devoted to the geography of the Roman Empire and the settlement of the border lands on the north. Part II analyzes the evolution of the political pattern of the continent, with emphasis on the nation state. Part III stresses the economic geography of contrasted regions during the Middle Ages and the early years of our era.

In reading this description of different European regions at successive periods one is impressed with the resemblances between this book and *Historical Geography of the United States*, by Ralph Brown. Like Brown, East begins his description with a period for which there is an abundance of geographic data and continues the story thru the period of active railroad building. A comparison of the two books—by Brown and East—will suggest many principles of methodology in historical geography.

George Peabody College for Teachers

J. RUSSELL WHITAKER

Griffith Taylor, *Urban Geography*, 439 pp., bibliography, index and 190 illustrations, diagrams. E. P. Dutton & Co., Inc., New York, 1946, \$7.50.

As the sub-title indicates this book is "a study of site, evolution, pattern and classification in villages, towns and cities." It is the first English textbook the writer has seen that is completely devoted to urban geography.

This book is divided into three parts. Part I on General Features (87 pages) consists of five chapters. Introduction and Scope of Book is followed by four others which consider Seven Towns in Seven Continents, Effect of Latitude; Characteristics of the Beginning of Settlements; Townships, Land Survey, and Effect on Town Plans and The Evolution of a Large City—Toronto.

In six chapters of 105 pages Part II presents historical changes in the site and pattern of cities from Neolithic to modern times.

Part III, Topographic and Other Controls, might have been redivided. The first six chapters are devoted to topographic and functional controls in modern towns such as geological control, towns sited on rivers, seaports and lake ports, mountain and mining towns, religious centers and resort towns. The last three chapters consider planned cities, regional surveys and classifications of towns.

The book is stimulating, challenging and well written. An abundance of detail provided by the author's own field experience and research, as well as the careful research of others, is presented in support of basic concepts. Although all geographers will not agree on all parts of this book, they will welcome it both as a basic, scholarly, pioneer work as well as a valuable text. For many it should furnish a foundation for research and suggest additional problems in investigation. To those who inquire concerning the content of urban geography, this book will often be cited.

Many will find the bibliography for further reading one of the most useful parts of the book. Some will be disappointed in finding only one picture in the book altho there are some three hundred plans and diagrams.

Indiana University

THOMAS F. BARTON

# *The* JOURNAL of GEOGRAPHY

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VOLUME XLIX

MARCH, 1950

NUMBER 3

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## OVERCOMING UNDESIRABLE INFLUENCES OF INFORMAL EDUCATION\*

EDITH PUTNAM PARKER

University of Chicago

### THE MEANING OF THE TITLE

The title of this paper is an implied question: What can we do in our instruction in geography to help young people overcome undesirable influences of informal, or out-of-school, education? There is no implication in this question that out-of-school education is on the whole undesirable. We all realize that human progress depends on it to an immeasurably large degree. Indeed, the major purpose of formal, or school, education is to help youths develop those viewpoints, that sense of values, and those abilities, powers, and desires which will lead them to guide their own informal education into channels from which will flow outcomes of great worth. Nevertheless, until one learns how to guide his own informal education into such channels (and I wonder how many graduates of our schools and colleges have learned to do so) some of the outcomes of such education are to be deplored and it is those outcomes with which the title question is concerned. We cannot prevent the undesirable results because many of the experiences from which they stem are inherent in circumstances not under our control. In our geography teaching, however, it is at least possible, tho by no means easy, to help minimize the very harmful effects of some of them.

Among the unfortunate outcomes of early informal education, perhaps none is more deplorable than are erroneous ideas about other people and peoples and the prejudices and wrong attitudes which grow out of those ideas. Such attitudes constitute obstacles that stand squarely in the way of bettering present intercultural relations: and the bettering of those relations is of tremendously

\* Presented at the Cleveland meeting of the National Council of Geography Teachers, November, 1949.

vital import to humanity today. In this brief paper, discussion will be centered on ways in which we can help, thru instruction in geography, to minimize the undesirable effects of unfortunate attitudes toward other peoples.

#### EARLY INFORMAL LEARNING

Knowing one's adversary always is helpful in contending with him. Accordingly, in order to see clearly what we can do, we need first of all to recall some facts about the learning processes involved in early informal education. As we are all aware, one's informal education commences, practically at birth, when his brain begins to function. By attention he gives to sounds, by observation of people and objects in his surroundings, by imitation of people he sees and hears, by discovery of pleasurable or painful consequences of his own acts, by asking questions, listening to answers, and the like, he gradually develops his innate powers. He learns to call people and objects by given names, thus beginning to acquire a vocabulary. Thru oft repeated efforts to do what others do, he gains muscle-coordinating ability enabling him, for instance, to walk, to run, to sing and so on. He forms habits of reacting in given ways to given types of stimuli, and he acquires a fund of simple ideas and the ability to express many of them orally in sentence form. Tho he achieves such development gradually, step by step, he does so with such rapidity that by the time he first reaches what we think of as school age, he already, thru wholly informal education, is a relatively accomplished young citizen accomplished, i.e., considering the few years he has been developing. Regardless of whether he is, for instance, a young Clevelander or a baby Korean, the same general learning processes have been involved in his development. With regard to specific vocabulary and various special abilities and ideas, however, results of early informal education are as different as are the people and objects in one's surroundings. The specific nature of much of what one acquires in those early years hinges on the experiences he *chances* to have in the particular locality and home in which his development has taken place. It is important in connection with this discussion to note both the common elements and this *chance* element in informal education. It also is important to note that, as is abundantly clear from its results (be they of great value or deplorable), informal education is exceedingly potent education. It really functions. The learning involved is what some educators call "organic" learning, to differ-

entiate real learning from learning of what I sometimes call the "cosmetics" type because it is veneer, not even skin deep. It washes off, and, lo!, the freckles and wrinkles are still there.

Now one significant fact which we often overlook helps to account for the potency of informal education: simple *reasoning* plays a vital part in one's acquisition of many, if not most, of the ideas he gains in the course of his early informal development. A four-year-old, for instance, made, with obvious conviction, the sudden announcement, "Children in our block like me better than they do Mary or Helen or Rose." "Who told you so?" her mother asked. The child acted surprised by the question and replied, "Why, nobody did. I know from what they do." Clearly her conclusion was one involving simple reasoning based on what she considered accurate findings from actual observation. I repeat. Simple logical reasoning plays a vital role in informal education.

#### THE NATURAL METHOD OF LEARNING

It seems a big jump to consider next some of the learning processes involved in gaining geographic knowledge of the type which Doctors of Philosophy are trying to discover thru scientific research: but to think briefly of those processes at this juncture and to compare them with the learning processes we have just noted will help us to see how to answer the title question. Many of the basic data which a research geographer uses are data he gets from direct observation of people and of objects to be seen in the particular locality about which he is, at any given time, seeking to discover truths. Geographic research always involves either direct field observation or the use of data which have been accumulated and recorded by an earlier direct observer. Such research also involves interviews with people in the area which is being studied. Answers which residents of the area give to questions asked them by researchers constitute part of the data on which conclusions reached thru research work are based. Because some of the facts discovered by observation cannot be adequately expressed in words, many of them are recorded in maps. Conclusions (1) about the nature of the complex of human beings, of man-made features (both visible and invisible), and of natural features which give the locality under consideration its geographic character and individuality, and (2) about the intricate interrelations existing between elements in that complex are reached thru reasoning based on the recorded data the researcher has accumulated. It is obvious that, with the exception

of the recording of facts in the form of maps, learning processes involved in discovering, thru research, new geographic truths are much like those involved in early informal education. Both involve learning from direct observation and from answers to one's questions; both involve reasoning based on the facts thus discovered; and both result in conclusions in the form of generalizations, arrived at thru that reasoning. Clearly, learning processes in both constitute what we may call the *natural* method of learning.

#### ONE PART OF THE ANSWER

From foregoing considerations, *one part* of the answer to the title question seems evident in view of (1) the naturalness and great potency of informal education and (2) the fact that scientists employ natural learning processes, thus reflecting belief in the efficacy of the natural learning method: *in our geography classes, we need to provide the kinds of experiences which give young people the opportunity to learn as naturally and as effectively as they learn from out-of-school experiences.* We need to keep ever in mind that teaching, if it be real teaching, is guidance in learning, as contrasted with pouring out results of the learning of others in the hope that they somehow will be digested. The learning always has to be done by the individual who is "being taught." Memorizing and repeating generalizations and facts on which they are based are not synonymous with real learning. One of the saddest commentaries on geography work in our schools and colleges is one which I hear repeatedly from graduate students. In effect it is, "I didn't even begin to realize clearly what geography is really getting at till I did the work for my thesis." I hasten to add that I am not advocating fourth-grade theses, but I am pleading for giving youths opportunity at every level of instruction to do real learning by employing natural, common-sense learning processes, instead of withholding such opportunity from them (as we are wont to do) until they reach a graduate level of instruction.

#### A SECOND PART OF THE ANSWER

As was stressed in the first sentence of the preceding paragraph, only a *partial* answer to our title question is furnished by consideration of learning processes involved in geographic study. *Merely* to provide for our youths experiences which let them learn by natural processes may result in as many erroneous ideas and prejudices as result from informal education. Sad to relate, it is not

difficult to find geography classes in which such experiences *are* being provided, but with the result that misunderstanding of other peoples is being increased, not decreased. We need to note two great *differences* between informal learning and geographic research which give us a clue to something *else* we must do if we are to help young people correct such wrong ideas of other peoples as they commonly gain from informal educational experiences.

One great source of unfortunate outcomes of informal education is the fact that only a few of the many data which must be taken into account in reaching correct conclusions are gathered in the course of the particular learning experiences one may *chance* to have. Wrong ideas frequently are acquired, and unfortunate conclusions reached, not because the learners did not reason accurately, but because they reached those conclusions from consideration of only part of the pertinent data. I can well remember, for instance, that by the time I was seven or eight years old I had arrived at the reasoned, tho erroneous, conclusion that something was clearly wrong with anyone who was a Democrat. That conclusion amounted to such firm conviction and prejudice that I even looked askance on classmates whose fathers were Democrats. It had been reasoned out on the basis of certain facts I had chanced to observe. First I had observed that my father and grandfather seemed always to try to take part in the praiseworthy affairs in the community. They often commented, "We must help out with that if we can. It is in a good cause." I also noted that time after time they took part in Republican affairs but did not take part in Democratic ones. I submit that, in so far as those facts go, my reasoning was logical; I reached my unfortunate wrong conclusion because the data on which I based it were entirely inadequate. I did not even know what Democrats and Republicans were. (As an aside I might inject that I am not sure I know today.)

In contrast, one who is qualified to do scientific research is fully aware of the danger of reasoning based on insufficient data, and exercises great care to avoid such reasoning and to qualify his conclusions in the light of that awareness. It is true that some geographic generalizations which once were thought to be demonstrable truths have now been discredited because new data bearing on them have come to light since they were made. Doubtless some that now are believed to be truths will prove not to be such as pertinent data not now available accrue. Thus basic knowledge grows. Research workers, however, conscious of this possibility of

error, are eager to change their conclusions on the basis of significant new data.

We must pattern after research, not after informal education, in this matter. *We need to give young people abundant experiences of kinds which help them to discover fallacies in conclusions they have reached thru reasoning based on insufficient data.* What outcome of geographic study could be of greater value to humanity than the habit, on the part of our citizenry, of withholding snap judgments? In connection with helping students develop that habit, it is well to bear in mind that, as intimated in earlier discussion of processes of learning involved in informal education, one learns to avoid repeating those actions which result in unpleasant consequences and to repeat those resulting pleasantly and calling forth commendation. It was R D Calkins, if my memory serves me correctly, who told of giving young people in a geography class some experiences which led them naturally to wonder how the Teachers College had come to be where it is in Mount Pleasant. He asked if they thought they could discover for themselves facts which in their opinion would help them reach some conclusions concerning the matter. They wanted to try, and came back with facts about location, transport, terrain, and the like. After they had stated and informally discussed their conclusions, he told them they hadn't mentioned one simple fact. It was that in a certain year, Mr. X had given to the public the particular site on which the institution stands with the express condition that the site be used for a normal school. Of course, the students saw at once that consideration of the added fact necessitated altering their conclusions. The incident left them with a somewhat sheepish feeling they didn't wish to have recur. Accordingly, they tried to avoid premature conclusions *for a few days thereafter* in their geographic thinking. Had they themselves, on the other hand, "dug up" that fact in the first instance, and been commended for so doing, the pleasurable results would have encouraged them to be on the lookout for similar facts in further investigative ventures. The significance of stressing "for a few days" should be noted. One can't overcome a habit of making premature judgments by one or two or three experiences helpful in so doing, or by being told the habit is bad.

To cite another specific instance, a sixth grade boy who had visited a particular locality being studied in his geography class reported his belief that practically all the automobile drivers there were careless, and in support of his conclusion cited instances of

their repeated violation of a given "rule of the road"—instances which he had observed with his own eyes. He was sent to a librarian who helped him find out about traffic regulations in that locality. He discovered to his dismay that it was his father, not the residents of the locality, who had done the violating. Tho a law-abiding citizen, the father had assumed that regulations were those familiar to him. Doubtless *that* boy thought *at least twice* before he made another such false generalization because it was unpleasant to be faced with the need for retracting his sweeping statement of condemnation of others.

The point to be made by calling attention here to such instances is that, altho no scolding or preachment suffices in such cases, *very frequently in our classroom work, opportunities arise for leading young people to alter for themselves conclusions based on insufficient data by directing them to significant data which they had overlooked. We must be constantly on the lookout for such opportunities and, by taking advantage of them, help the young learners gradually to overcome in so far as possible the common unfortunate habit of reaching conclusions prematurely.*

### A THIRD PART OF THE ANSWER

Consideration of a second major difference between informal education and research leads us to see still another part of the answer to our title question. It relates to one's realization of clear-cut, guiding motive or purpose. In the course of one's early informal education, he learns whatever momentarily catches his attention and fancy. For the most part he does not consciously or deliberately seek a particular kind of knowledge. In geographic research, on the other hand, one knows what kind of knowledge he seeks, and deliberately centers his efforts on collecting such data as may have a bearing on discovery of truths of the type which, together, constitute knowledge of that kind. Again, we teachers of geography must pattern after research, not after early informal education in this matter. It may seem ridiculous to say that little people can have such motive and purpose, but they can. It so happens that many data which geographers use are such as to satisfy curiosity commonly felt by human beings, young and old, concerning differences to be observed in different parts of the earth. Much travel for pleasure, for instance, is motivated in part by such curiosity. If children are shown in *carefully selected pictures* of landscapes in Java, for instance, some of the significant man-made features in

the "complex of people, man-made features and natural features" which give that part of our earth its geographic character, individuality or personality, they are naturally interested in observing for themselves differences between what they find there and what they have seen elsewhere: nor do they stop with "whats" unless they already have had their natural learning tendencies greatly inhibited by a multitude of classroom experiences of the "read-the-next-two-pages-and-recite" type. It was, indeed, a fourth-grade boy who gave me years ago my first inkling of the fact that real learning in geography, at *all* levels of instruction, "parallels" research learning. From facts he gleaned from pictures of Java settlements and a map showing closeness of some of the settlements, he arrived at the conclusion that people were more crowded together there than in any other farming region which he had seen, either actually or in pictures. He asked almost instantly after stating his conclusion, "How does it happen that so many farmers live in such small spaces here?" That very night, it so happened that I heard Ellen Semple, a famous American research geographer, talk at the Geographic Society of Chicago. She began her address by saying that the density of population in Java was something she had never been able to understand to her satisfaction. She accordingly had just devoted a considerable period of time to research there in an effort to discover facts contributing to better understanding of that characteristic of the area. She reported findings which aided her in seeing how that characteristic had developed there; how intricately interrelated were the elements in the "complex of people, man-made elements, and natural elements" which distinguish Java from other regions; and how the work of the people there is functioning in their community and in the world. If initial stimuli (in the form, for instance, of *properly selected* pictures) be provided, children's curiosity moves them to have at once the same general kind of motive and sense of purpose which a research geographer has, even tho they do not recognize it as "geographic purpose" as does the researcher. It is impossible to overestimate the tremendous importance in teaching geography of the very difficult task of providing in each unit initial stimuli and experiences which lead pupils or students at once to have a specific end in view from the outset—an end which is a *geographic* one, whether or not they recognize it as such. *Proper selection of motivating, goal-setting experiences in every unit is a very vital part of the answer to our*

*title question.* To make proper selection is one of our great challenges as teachers. It involves knowing in advance ourselves the specific major ideas and conclusions which the learners should arrive at in pursuing their initial geographic purpose.

#### DIAGNOSTIC QUESTIONS

In a brief paper it is impossible to go much further with answering the title question than the discussion of need for "natural" learning experiences, for experiences helpful in learning to refrain from making premature judgments, and for careful selection of motivating experiences has taken us. It would be helpful to discuss each of the research-guiding questions, for instance, which Dr. Platt lists in one of his recent articles,\* and note their counterpart in classroom work, but such discussion would require more than one brief paper. Instead, we can list some questions to ask ourselves that will help each of us (myself included) improve our own classroom work.

How clearly do I have in mind, *before* I select motivating experiences I provide in any given unit, what geographers have discovered about how the various types of elements in the geographic complex of the locality to be studied are interrelated?

What opportunity am I giving youths in my class to discover from observations of real or pictured landscapes facts of significance (1) in motivating desire to understand that particular local complex and (2) in gaining understanding of it which is correct as far as it goes? (No one, of course, has *complete* understanding of how present geographic complexes have come to exist.)

How much am I letting young learners ask questions concerning significant things they observe about the locality to be studied *before* they do any reading or hearing about the people and other features observed other than reading or hearing sentences which merely introduce the locality by its name and general location?

If questions they ask from initial observation are not those manifesting clear-cut geographical motive and purpose, what is wrong with the selection of the introductory material designed to provide motivating experiences?

Am I saying time after time in answer to their questions, "Perhaps you can find on page x facts which are helpful in answering your questions," thus helping them develop the habit of "in-

\* Platt, Robert S., "Environmentalism versus Geography," *The American Journal of Sociology*, Vol. LIII, No. 5 (March, 1948), p. 356.

interviewing," as it were, authors; of "asking the map" and the like?

Am I giving opportunity for informal discussion by the class members of their findings from observation and "interviewing"?

Am I giving them opportunity to reach conclusions based on those findings and grasping opportunities to let them discover that false conclusions are reached by reasoning from insufficient data?

Am I vainly expecting them to develop from scattered ungraded experiences a functioning geographic point of view and skills and habits involved in using pertinent facts effectively, or am I recognizing the repetition element in the natural learning process and meeting their need for unit after unit of carefully graded experiences?

Are the young people under my guidance just "covering" material or are they learning to apply almost instinctively, as it were, a geographic point of view to new situations?

To what degree, in short, am I providing learning experiences as natural as those involved in informal education and in research, the while I am eliminating the chance element in informal learning? (If we are not to eliminate the chance element, if the passing whims of children are to shape the curriculum, why have schools at all?)

Now, if we make honest answers to such questions, none of us (myself included) will have cause to be very proud of his answers: but each of us will be moved, I believe, to improve his teaching and be gradually able to take more and more legitimate pride in its outcomes.

#### THE ANSWER IN BRIEF

The answer to our title question can be stated briefly in another way. If and when we teach geography at every level of instruction as the unified observational science which it is, we cannot fail to help overcome many of the undesirable influences of informal education. We cannot fail to help young learners develop a geographic point of view that will be of enormous value to them in themselves guiding their informal education into channels from which flow worthy outcomes such as better and better understanding of different problems people face in different localities.

#### PROGRESS

As various relatively recent published articles indicate, we are making headway in giving the right kinds of guidance in learning

—notice that I say “guidance in learning” instead of “teaching.” Clearly, for instance, headway has been made in the very city in which we are now meeting: articles such as those of Miss Villa Smith and Mrs. Adelaide Blouch, to give only two examples, are evidence of that progress. Our motto, I feel certain, is “Onward.” With our will we will bit by bit find the way.

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## MAP KNOWLEDGE FOR GRADE SCHOOL GEOGRAPHY TEACHERS

LYDA BELTHUIS

University of Minnesota, Duluth Branch

In instructing grade school children, a teacher stresses certain materials which are considered fundamentals. In arithmetic, the multiplication tables are the background for all later work; in reading, the recognition and sounds of letters and the use of words and sentences are the basis of development. In geography, one of the subjects which involves reading ability, there are still other requirements for effective teaching and learning. One of these is an understanding of the map, the most important tool in interpreting the printed page. Many grade school teachers learned but little about maps in courses they have had. To help such people, a few important facts about maps and their use are suggested below. These may be used as a list against which instructors may check their knowledge.

### GLOBES AND PROJECTIONS

A globe is the only true model of the earth.

All projections are man-made devices to show part or all of the earth's surface on a flat plane in as accurate a way as possible for the purpose intended.

### CLASSIFICATION OF PROJECTIONS\*

For general presentation purposes, projections are usually classified as three groups—rectangular or cylindrical, conic, and azimuthal.

1. The cylindrical or rectangular projections are constructed on the principle, but not the actual plan, of wrapping a sheet of paper

\*An inexpensive publication giving illustrations and descriptions of projections discussed in this paper is Hammond's *Comparative World Atlas*, 1947, Desk Edition.

about the globe with the line of contact being the only correct part unless, as is usually the case, other means are used to reduce this error.

2. Conic projections are based on the idea of placing a cone over the globe touching on some parallel which is the only correct part. Conic projections with two standard parallels, in contrast to one, make a fairly accurate map of an area having general east and west extent.

3. Azimuthal, or perspective projections as they are sometimes called, are projected on a plane surface and are classified as orthographic, stereographic, and gnomonic according to the place or eye point from which the projection is made. If this point is at infinity, the projection is an orthographic; if at the antipode, it is stereographic; if at earth center, it is gnomonic. They are developed as polar, equatorial, and oblique cases with maps centered respectively at the poles, the equator, and at any point between the equator and poles. A projection of this group which has been used widely recently for air-age maps is the polar equidistant one.

#### MAP CHARACTERISTICS

Maps have several properties. Two of the more important for general use are equivalency (equal-area) and conformality (true shape). Maps having the characteristic of equal area are used for plotting distributions such as acreages of wheat in various parts of the earth. Conformal maps are important for school use as they show the true shape of continents.

#### FAMILIAR OR COMMON PROJECTIONS

1. The Mercator is true in area only at the equator while poleward the exaggeration of area becomes greater and greater. Its major value is for navigation purposes because routes can be plotted as a series of straight lines on the map and compass direction be maintained.

2-3. Goode's Homolosine and Modified Sinusoidal are two of the better projections for world maps. They are equal-area in construction yet give the appearance of conformality.

4. Bonne's, an equal-area projection, is used much on European maps for continents and also by American map makers to some extent for the same purpose.

5-6. Lambert's Conformal and Alber's Equal-Area as their

names indicate are respectively conformal and equal-area projections which are being used much for maps of United States. Each of these has two true scale parallels and a maximum error of a few per cent.

7. The Polyconic projection serves as a base map for the United States topographic sheets. Topographic sheets are detailed maps showing elevation differences by means of contour lines and commonly having a one inch to one mile approximate scale.

8. Others

a. The International Map of the World is a detailed map on a modified polyconic projection which has a scale of 1 inch to 16 miles. When completed it will include a total of about 1500 sheets.

b. Aerial photographs when taken vertically at a scale of 1:20,000 or larger, show in detail both natural and man-made features.

### MAP SCALES

Scales represent a ratio between map distance and ground distance and are shown on maps in three different ways. These are (1) the representative fraction which uses the ratio of an inch on the map to inches on the ground as 1:63,360; (2) verbal which is written on the map as "one inch to one mile;" and (3) the graphic scale, the familiar line and its divisions denoting distances on the map. These scales can be converted readily from one to another. They appear both as exact (1:63,360) and approximate (1:62,500) scales. In some cases, as in Goode's Atlas and some wall maps, all three types are given on a single map.

### MAP LEGENDS

Legends consist of a series of standard symbols which are found on all maps. They show both man-made features such as roads, railroads, and cities, and also those of nature as surface differences, drainage, and others.

### COORDINATES

Parallels of latitude and meridians of longitude, commonly called coordinates, are used for location purposes. They may be used for obtaining an approximate scale if none is given on a map. Scales may be computed by using the value of a degree of latitude or by determining that of a degree of longitude thru the use of tables giving such information.

## SOURCES FOR EQUIPMENT AND SUPPLIES

Many materials are available thru well known publishing and supply houses. Others may be obtained from our government agencies thru the Superintendent of Documents and from representatives of other countries stationed here.

There are two ways by which the reader who may be interested in securing additional map knowledge may proceed. First thru reading about maps. If this plan is chosen, some of the following publications may be of aid:

Raisz, Erwin, *General Cartography*, McGraw-Hill, (2nd ed.), 1948.

Lobeck, A. K., and Tellington, Wentworth J., *Military Maps and Air Photographs*, McGraw-Hill, New York, 1944.

Peattie, Roderick, *How to Read Military Maps*, George W. Stewart, Publisher, New York, 1942.

Deetz, Charles, and Adams, Oscar S., *Elements of Map Projections*, Special Publication No. 68, (5th ed.), U.S. Dept. of Commerce, Coast and Geodetic Survey, 1945.

Deetz, Charles, *Cartography*, Special Publication No. 205, (2nd ed.), U.S. Dept. of Commerce, Coast and Geodetic Survey, 1943.

Olson, Everett C., and Whitmarsh, Agnes, *Foreign Maps*, Harpers, New York, 1944.

Carls, Norman, *How to Read Aerial Photographs for Census Work*, U.S. Dept. of Commerce, Bureau of the Census, Washington 25, D.C., 1947.

Smith, H. T. U., *Aerial Photographs and Their Applications*, D. Appleton-Century Inc., New York, 1943.

Musham, H. A., *The Technique of the Terrain*, Reinhold Publishing Corporation, 330 W. 42nd St., New York, 1944.

Hoffmeister, H. A., *Construction of Map Projections*, McKnight and McKnight, Bloomington, Ill., 1946.

The second way to learn more about maps is by taking a course which stresses map and visual aid information and other geographic knowledge a teacher needs. It may be listed as "Geography for Teachers" or have a similar title and is available in some colleges and universities.

With aid from either of these two sources, a teacher can really understand a map and may help a child to know more about it.

## PHYSICAL GEOGRAPHY OF THE KUNMING BASIN, YUNNAN PROVINCE, CHINA

BENJAMIN A. TATOR

Louisiana State University

### GENERAL SETTING

The Kunming Area includes a large intermontane lake basin and its bordering highlands in eastern Yunnan province, southwestern China (Fig. 1). This is one of a number of similar basins of tectonic origin characteristic of Yunnan, the majority of which were occupied by lacustrine waters during the relatively recent geologic past, but have since been drained. The Kunming basin, containing lake K'un-yang, still retains a portion of its original water body. Other intermontane lakes, including Fuhsien Hai, Yang-tsung Hai, and Chilu Hai, are present in smaller basins located to the east and south of the Kunming basin (Fig. 2).

The rugged topography which characterizes Yunnan province places mountain barriers and deep, often impassable valleys across all approaches to the Kunming basin. These physical obstacles have prevented the development of adequate communications with surrounding regions. Consequently, the area has occupied an isolated position until very recent time. Prior to World War II this portion of China received only spasmodic domestic and foreign attention. Thruout the latter half of the 19th century and early decades of the 20th century attempts were made by French and British interests to gain a foothold in the province. The French completed in 1910 a narrow-gauge railroad from the French Indo-China coast at Haiphong to the provincial capital, Yunnan-fu, located in the Kunming basin (Fig. 1). The British had access to the area in the decade preceding the last war by means of the Burma Road, but this route has proved economically feasible only under wartime pressure. Early Chinese interest, stimulated for brief periods by the presence of mineral deposits, was hampered by the remoteness of the area. The difficulty of communication with the rest of China has prevented large scale exploitation of valuable natural resources by the Chinese government.<sup>1</sup>

The attention of western powers was drawn to this region during the recent world conflict with the recognition of the strategic

<sup>1</sup> George B. Cressey, *China's Geographic Foundations—A Survey of the Land and the People*, McGraw Hill Book Company, New York, 1934, pp. 72, 107, 122-126.

importance of certain localities as bases for operation against the Japanese. The geographic isolation and defensibility of the Kunming Area, as well as other similar areas in western China, made these ideally suited for use as supply terminals for aiding the Chinese. The Kunming basin in particular provided ample space for development of a large air terminal. Furthermore, it is the

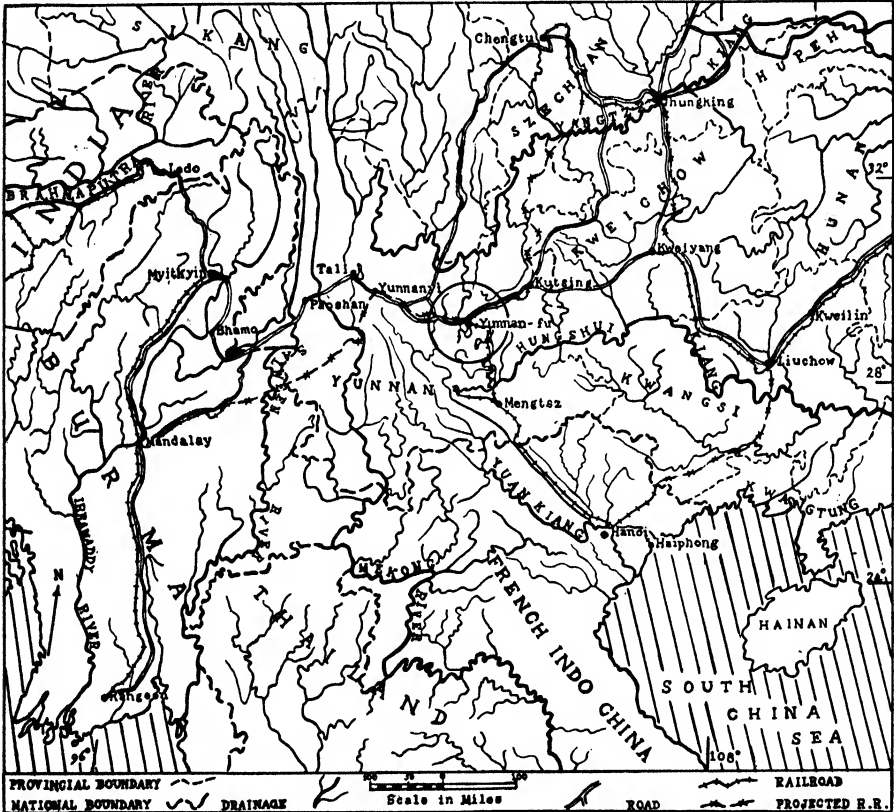


FIG. 1. Location of Yunnan Area.

eastern terminus of the Burma Road. Airfields were constructed, air routes charted, new roads built, and existing roads improved. Thus the war not only stimulated interest in the area, but it also resulted in marked improvement of facilities for communication with adjacent regions. The Kunming basin, the largest tract of habitable ground in the province, is the logical center for economic growth of the province. This paper is concerned with the physical factors which have aided the development of the Kunming basin as a distinct cultural unit.

## LOCATION

The Kunming basin is located between latitudes  $24^{\circ} 38'$  and  $25^{\circ} 4'$  North and longitudes  $102^{\circ} 35'$  and  $102^{\circ} 50'$  East (Fig. 2). Rugged, deeply dissected, mountainous terrain separates the area from the valley of the Yangtze Kiang 80 miles to the north. The

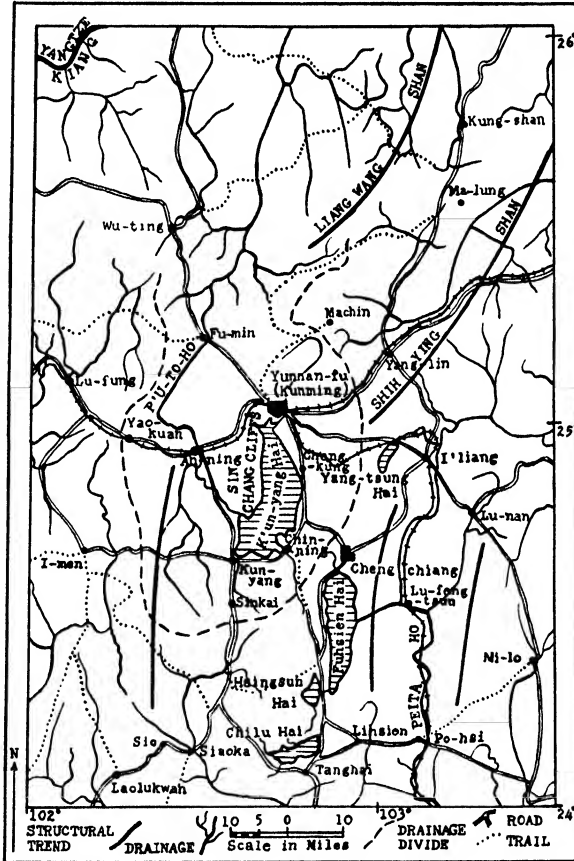


FIG. 2. The Kunming Basin.

Burma border lies about 250 miles to the west, the country in this direction being occupied by increasingly mountainous topography culminating in the southward continuation of the Himalaya arc along the valleys of the Salween and Mekong rivers. The Burma Road traverses this western approach to the basin. The French Indo-China border is located 150 miles to the south, the surface in this direction being rugged and dissected by deep valleys, notorious

as breeding places for disease. The distance from the basin to the French Indo-China coast is approximately 400 miles, the coastal city of Haiphong being connected to Yunnan-fu, principal urban center of the Kunming basin by the narrow-gauge railroad constructed by the French (Fig. 1). A road affords connection with Kweiyang in Kweichow province 270 miles to the northeast and a railroad leads from that city into southeastern China. Another road extends to Chungking, wartime capital of China, approximately 400 miles northeast in Szechwan province. These eastern and northeastern approaches are hampered by rugged topography, tho many of the roads have been recently improved.

### CLIMATE

The climate is a subtropical monsoon type, the controlling factor being altitude rather than latitude.<sup>2</sup> The elevation of the lake basin is 6,400 feet, this altitude producing a more temperate climate than is normal for similar latitudes in southern Asia. According to Cressey<sup>3</sup> the average summer maximum is 26° C. and the average minimum temperature is 4° C. Thus the winter is quite mild and the summer is pleasantly cool. Seasons are more noticeably based on wet and dry contrasts than on temperature differences. The rainy season lasts from May thru October, the rainfall often being torrential. The yearly average recorded at Yunnan-fu is approximately 40 inches, practically all of which falls during the rainy season. The dry winters are characterized by strong southwesterly winds which locally reach considerable intensity, often resulting in dust storms where moisture and vegetation are scanty.

### PHYSICAL SETTING

**Topography.** The floor of the basin is occupied by a relatively broad, elongate lacustrine plain with a longer dimension of approximately 35 miles in a north-south direction and a width of from 10 to 12 miles (Fig. 2). Lake K'un-yang, about 25 miles long and 5 to 7 miles wide, occupies the western half of this plain. The surrounding country is prevailingly mountainous with northeast-southwest trending limestone ridges projecting from 1,500 to 2,000 feet above the basin floor, rising in some localities to more than 8,000 above the sea (Fig. 3). One such particularly high ridge parallels the western

<sup>2</sup> Mei-Ngo Jen, "Agricultural Landscapes of Southwestern China: A Study in Land Utilization," *Econ. Geog.*, Vol. 24, No. 3, (July, 1948), pp. 158-159.

<sup>3</sup> Op. cit., Cressey, pp. 373-375.

edge of the lake, presenting an extremely precipitous escarpment known locally as the Sin Chang Cliffs (Fig. 4). This feature is a fault scarp showing little modification by erosional agencies. Faulting activity in this region dates from late Pliocene and it appears likely that faulting and regional uplift are still occurring at present.<sup>4</sup> A broad alluvial flat, slightly above the present lake level, separates the lake from mountainous ridges to the north, east and south (Fig. 5). Several remnants of lake terraces occur at eleva-

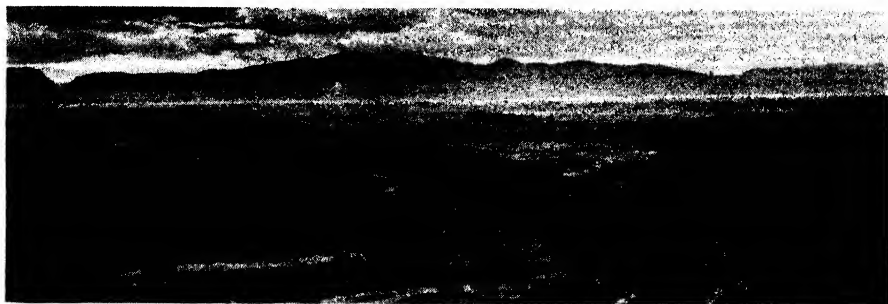


FIG. 3. Panorama of the Kunming basin from the eastern side. The high rimming ridges which delimit the basin are visible in the background. Note the hill terracing in dry paddy in the foreground.

tions from 10 to 100 feet above the present basin floor along the eastern side.

**Drainage.** The basin is drained from the southwestern portion by the P'u-to-Ho, a tributary to the Yangtze Kiang (Fig. 2). This single outlet passes thru the high escarpment formed by the Sin Chang Cliffs in a deep narrow valley. The stream flows westward and then northward to join the Yangtze Kiang. Other, more minor streams, dry during much of the year, drain into the basin from the surrounding highlands. The drainage in the high terrain around the basin has produced a karst topography in many localities.

A major drainage divide follows the crests of the high ridges east, south, and west of the basin (Fig. 2). The runoff east and south of this divide reaches the Peita Ho, tributary to the Hung-shu Kiang. Yangtsung Hai, Fuhsien Hai, and Chilu Hai all drain into the Peita Ho. The drainage west of this rimming divide is southward into the Yuan Kiang system. Within the basin drainage is northward into the Yangtze Kiang as mentioned above. There is ample evidence of stream capture in the region and the lake basins,

<sup>4</sup> Op. cit., Cressey, p. 36.



FIG. 4. View south along the Sin Chang Cliffs showing the precipitous nature of this fault scarp feature. Note the paddy-type cultivation in the small deltaic forms along the cliff base.

formerly enclosed systems, are now drained by captor streams.

An outstanding relief characteristic of this area is the great depth and extreme narrowness of the stream valleys. The P'u-to-Ho, for example, flows in a precipitous canyon, 2,000 or more feet deep in places. At the point of junction of this stream with the Yangtze Kiang the relief is in excess of 8,000 feet. The valleys of minor streams are also narrow and deeply excavated. The lake plain offers the only large tract of ground where a sizable population could exist, the area surrounding the basin being too difficult for normal habitation. The deeply incised drainage lines add to the physical isolation of the basin since they do not provide feasible locales for lines of communication.

#### CULTURAL SETTING

This largest of the numerous lake basins of Yunnan province is a center of Chinese culture in a somewhat alien cultural setting. Similar Chinese cultural islands occur thruout the province where these lake basins are present. Chang<sup>5</sup> states that in Yunnan the region between 5,000 and 6,500 feet, where the climate is mild and the surface relatively level, is occupied by Chinese. Higher eleva-

<sup>5</sup> Chi-Yun Chang, "Climate and Man in China," *Annals Assoc. Am. Geogr.*, Vol. 36, No. 1, 1946, pp. 55-56.

tions are inhabited by more primitive cultural groups. The Chinese are migrants from other provinces, having pushed the former occupants of the basin areas into the intervening mountainous regions. The original inhabitants, mainly Lolo and Miao, occupy in general the higher mountain valleys and slopes around the basins. The latter live in quite primitive fashion as hill farmers and herdsmen and have distinctly different dress and dialect which set them apart from the Chinese of whom they are quite resentful.

All of the larger settlements located on the basin plain are distinctly Chinese in character. The four important urban centers, each located on a local deltaic feature along the shore of Lake K'un-yang, are Yunnan-fu (Kunming), Cheng-kung, Chin-ning, and Kun-yang (Fig. 2). These are now connected by good motor roads improved during the war. The walled character of the towns within the basin is a reminder of the rather precarious existence of the Chinese culture in a hostile setting. Yunnan-fu was a walled stronghold until quite recently, remnants of the old city wall being apparent in places around the perimeter of the city.

Due to the inadequacy of the Chinese census no positive figures



FIG. 5. View northeast from the Sin Chang Cliffs across Lake K'un-yang. The broad lacustrine flat is visible between the lake and the high rimming hills along the eastern side of the basin.

of population density are available. Jen<sup>6</sup> accepts a figure of 548 persons per square kilometer as an average population density in the cultivated portion of the basin. The same author advances a figure of 404,000 persons for Yunnan-fu. Wilton<sup>7</sup> in 1917 estimated that this city had a population of 100,000. Whatever the actual figures may have been, the recent war resulted in a manifold increase in the urban population, particularly in the latter city. No accurate figures concerning rural population increase are available at this time.

The cultural pattern of the basin plain is almost entirely agrarian, the basin floor being under heavy paddy cultivation. According to Jen<sup>8</sup>, 49 per cent of the total area is in paddy, 11 per cent in dry field, 3 per cent in forest, and 37 per cent is unproductive. Since this survey included the steeper slopes of the basin sides as well as the lacustrine plain, the large percentage of unproductive land is explainable. It was the present writer's observation that the more moderate slopes and the higher terrace surfaces along the eastern side of the basin are quite heavily terraced in dry field locally, the land being utilized wherever possible. One interesting type of farm, evidence of the intensity of cultivation, is found on small deltaic protuberances of the lake shore, particularly along the base of the Sin Chang Cliffs along the west side of the lake. The writer was informed that this extremely wet type of farming is very productive and the owners of such farms are quite well-to-do, combining fishing with farming to great advantage. (Fig. 5).

An ancient irrigation system, reputedly dating back to the first Chinese settlement in the basin around 200 B.C., carries moisture from the eastern and northern rim across the lake plain. These irrigation lines make a very interesting geometric pattern in aerial view in that they are lined with poplar and bamboo (Fig. 6), as are also the roads and trails thruout the irrigated part of the basin.

Rice is produced in the paddy areas, whereas wheat and maize are the crops of the higher dry fields on the terrace remnants and on the slopes around the basin perimeter. The terrace levels, being well-drained areas, are often orchard sites, the basins of Yunnan being noted for the production of several kinds of fruit. In the village vicinities many kinds of vegetables are raised for urban use.

<sup>6</sup>Op. cit., Jen, p. 166.

<sup>7</sup>E. C. Wilton, "Yun-nan and the West River of China," *Geogr. Journ.*, Vol. 49, 1917, p. 427.

<sup>8</sup>Op. cit., Jen, p. 165.

These grow to remarkably large size as a result of the "night soil" fertilization. It is interesting to note that Simpson<sup>9</sup> claims that Yunnan is probably the original home of the maize plant, this plant being found in the wild state in many portions of the province. This claim, however, is doubted in many circles.



FIG. 6. View showing lines of poplar which fringe the irrigation lines and roads thruout the lacustrine plain. The troops in this view were moving toward the French Indo-China border when the photograph was taken.

Tho the predominant farming traits are Chinese, the widespread usage of water buffalo as a farm animal is borrowed from Burma and India. This valuable beast abounds thruout Yunnan, being particularly useful wherever paddy cultivation prevails (Fig. 7). Oxen are also common, and the small Mongolian pony is used quite widely. Livestock raised for food includes pigs and chickens. In the surrounding hills herds of goats and sheep are common, the higher grass-covered slopes affording good pasturage. The grazing potential of Yunnan has not as yet been properly exploited.

The majority of the inhabitants of the lake basin profess Buddhism, numerous temples of this faith being found near every village

<sup>9</sup> A. R. B. Simpson, *Asia*, Bell and Sons, London, 1939, pp. 168-170.

and in many places high on the mountain slopes. Mohammedanism was once prevalent but has since been all but stamped out. The Mohammedan Rebellion, a religious war fought between 1856 and 1872, resulted in the almost complete annihilation of the Moslems. Ruins caused by this conflict are still observable in many localities within the basin. The estimate is made that 10,000,000 people were killed during this war throughout the province, the sparsity of population in some localities being attributed to such decimation. Christianity has been successful to a minor degree, particularly in the

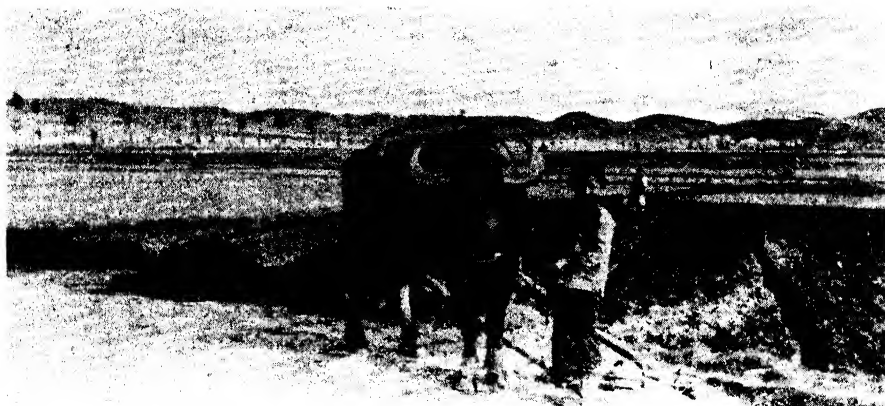


FIG. 7. Small boy and water buffalo on the edge of rice paddy cultivation in the basin area east of Yunnan-fu. The highland rim along the northeast side of the basin is visible in the background. Note the poplars along the road in the left of the view.

Yunnan-fu vicinity. French Catholicism is perhaps foremost in this respect due to the greater ease of communication with French Indo-China. In general, however, the Christianizing influences have had little cultural effect.

#### SUMMARY

The characteristic topography includes a broad expanse of lacustrine flat with slightly higher-standing terraces along the eastern and southeastern sides, the entire basin being rimmed all around by high rugged limestone ridges dissected by deep narrow valleys. The terrain immediately adjacent to the broad lake plain is typical of Yunnan province in general, in most places presenting a karst-like topography. This difficult terrain has resulted in geographic isolation of the Kuming basin from the rest of China. The inhabitants are mainly migrant Chinese, the older Miao and Lolo stocks having been driven into the adjoining highlands. The econ-

omy is predominantly agrarian, rice being the principal staple. Hence the basin forms a single cultural unit, Chinese in character.

This particular area afforded a base of supply for operations against the Japanese during the recent conflict. This factor has stimulated the economic development and has partially overcome some of the barriers responsible for isolation of the region. The establishment of airfields and the improvement of road connections with other parts of Asia have given the Kunming Area a much more important position in the Chinese economy than heretofore. A regular air service now connects with cities in Burma and India, bypassing the rugged terrain of the Burma border region. Airfields built during the war in various parts of western China are being utilized. The writer made trips over the improved Burma-Stillwell Road from Ledo, India, to Yunnan-fu, China, early in 1945. Tho this route is certainly no express highway, it is quite passable for heavy traffic provided continuous effort is applied to keep it in usable condition. The French railroad to Indo-China was not severely damaged by the warring powers and should provide an adequate and increasingly useful line of communication with the southern coast. Improved roads now connect the Kunming Area with Kweiyang and Chungking in Kweichow and Szechwan provinces to the northeast. A railroad leads from Kweiyang into southeastern China, tho this line sustained some war damage. Another has been projected for some years between Yunnan-fu and Mandalay in Burma. The writer observed tunnels and grading for this project in its proposed eastern portion between Yunnan-fu and Yunnanyi. Tho a costly venture and perhaps one of the world's most difficult engineering problems, this line is indispensable for proper economic development of southwestern China. This is a region of known mineral wealth and the betterment of communications will lead to more rapid exploitation of that wealth in the future. The Kunming basin will be the focal point of this economic activity.

## ANNUAL MEETING OF THE THIRTY-FIFTH YEAR NATIONAL COUNCIL OF GEOGRAPHY TEACHERS

More than four hundred members and guests of the National Council of Geography Teachers attended the meetings at Hotel Cleveland, Cleveland, Ohio, on November 25 and 26. Those registered included teachers from all grade and college levels of geography, supervisors, administrators, and others. More than seventy colleges and universities were represented, and more than thirty states and the District of Columbia were listed.

At the First General Session on Friday morning, Dr. Earl B. Shaw, President of the National Council, opened the meeting and presented Dr. John Schoff Millis, President of Western Reserve University. In extending greetings to the National Council, Dr. Millis emphasized the unique position of geography, since it can and should be both a centripetal and a unifying force. Dr. Harry O. Lathrop responded on behalf of the National Council.

Four papers were read—each of which proved thought and discussion. Professor Edith P. Parker presented the topic, "Overcoming Undesirable Influences of Informal Education," followed by Zoe A. Thralls with "World Patterns in High School Geography," and Lewis F. Thomas on "An Evaluation of Geography Teaching at the College, University, and Graduate Levels." The concluding paper was by Mary Viola Phillips on "A New Curriculum for High School Geography in Pennsylvania."

An open luncheon meeting of State Coordinators in the Empire Room was attended by one hundred thirty four persons. A State Coordinator and a distinguished guest acted as hosts at each table. With the theme of "Sharing Experiences," three State Coordinators read papers. Annice Davis Elkins of Kissimmee, Florida, told of "Resource-Use Education as a County-wide Project"; Joseph E. Williams of Seattle, Washington, read a paper on "Some Cartographic Activities in Teaching Geography," and Lyda Belthuis of Duluth, Minnesota, used her kodachromes of Australia to illustrate "Photography as an Aid in Teaching Reality."

On Friday afternoon, there were three sectional meetings.

At Section 1, the theme was "Working Together for Common Goals." About fifty-five people were present. Dr. George A. Mallinson, Western Michigan College of Education at Kalamazoo, read a paper on "The Relationship Between the Work of Elementary Science and Geography Teachers"; C. O. Fitzwater of the Rural Department of the N. E. A. outlined "Common Goals for Rural Educators and Geographers," and Clyde F. Varner of the Cleveland Board of Education spoke on, "The Relation of Geography to Other Social Studies and Physical Sciences in the Cleveland Schools." The spirited discussions resulted in recommendations that people from other related fields be invited to present papers on topics of mutual interest. The section chairman was Thomas F. Barton of Indiana University, and Merna Irene Fletcher of the University of Missouri was secretary.

At Section 2, the theme was "Trends in Geographic Visual Aids—The Motion Picture." About one hundred twenty-five people observed the showing of two films. Participants in the discussion were Minnie Lemaire of Mt. Holyoke College, Elizabeth Eiselen of Wellesley College, Edwin MacArthur representing the film producer, and Clyde Kohn, Northwestern University, who also was chairman. James Rinier of Kent State University as secretary reported the controversial nature of the discussion and evaluation of the films.

At Section 3, forty members of Gamma Theta Upsilon from fourteen chapters heard Dr. George Hubbard, Professor Emeritus of Oberlin College, talk on "Opportunities and Responsibilities for Students of Geography." Two students participated in the program: Miss Alta Baker of Bowling Green State University, Ohio, discussed suggestions for local group activities, and Miss Betty Heisner of Southern Illinois University at Carbon-

dale, talked on policies and programs for honorary members. The national president of the fraternity, Dr. Warren Strain of Slippery Rock, Pennsylvania, was chairman and Miss Ina C. Robertson of Valley City, North Dakota, was secretary.

By four o'clock the meetings had adjourned. Buses provided transportation along the outer lake shore drive to Hatch Hall at Western Reserve University. A large number of geographers accepted the invitation to the afternoon Tea, a courtesy of the Departments of Geography of Kent State University, Oberlin College, and Western Reserve University.

At the annual banquet on Friday evening, two hundred thirty-four were present. Dr. Shaw presided. Dr. George J. Miller, Editor of the *JOURNAL OF GEOGRAPHY*, announced the recipients of the two prizes conferred in 1949; the Isaiah Bowman Prize to Dr. James W. Coulter, Specialist, United Nations, for his article entitled "The United States Trust Territory of the Pacific Islands," and the Cora B. Sletten Prize to Miss Villa B. Smith of John Hay High School, Cleveland, for her article entitled "The Bulk Freight Trade of the Great Lakes."

The Distinguished Service Award citation was read by Thomas F. Barton in the absence of Mary Jo Read, chairman of the Committee. The award was presented by President Shaw to Miss Edith Putnam Parker in recognition of her leadership and outstanding contributions to geographic education and research.

The National Council was honored by the presence of Dr. Gilbert Grosvenor, President of the National Geographic Society, and Mrs. Grosvenor. Dr. Grosvenor related some of the outstanding achievements of National Geographic expeditions with emphasis on the one in 1949 to Nepal. Then Mr. Volkmar Wentzel, staff photographer and writer, supplied the commentary to accompany the showing of splendid colored films taken on the Nepal Expedition—one of the first scientific groups to enter the country. Following the program, there was an informal reception for the Past Presidents of the National Council and distinguished guests.

First Vice-President, Loyal Durand, Jr. of the University of Tennessee, presided at the Second General Session on Saturday morning. Papers centered on the theme, "Reports From the Continents." The speakers and topics were: Shannon McCune of Colgate University on "Confusion in Asia"; Samuel Van Valkenburg of Clark University on "Can Western Europe Meet the Postwar Challenge?"; Roderick Peattie of Ohio State University on "The Racial Problem of South Africa," and Langdon White of Stanford University on "Storm Clouds Over the Andes: The Sierra Indian Begins to See the Light."

The Third Annual General Assembly of the National Council was held Saturday afternoon with President Shaw in the chair. The Minutes of that session appear as the Secretary's Report elsewhere in this *JOURNAL*. The adjournment of the Assembly marked the close of the thirty-fifth annual meeting.

## MINUTES OF THE THIRD GENERAL ASSEMBLY

At two o'clock on Saturday afternoon, November 26, 1949, more than seventy-five members of the National Council met to conduct the business of the Third General Assembly. President Shaw spoke of his appreciation to the members and officers who have worked untiringly on behalf of the National Council.

The Secretary reported on the activities of the office. The membership in the National Council shows a steady growth, with a paid-up membership in good standing of 1366. Twelve of the states

north of the Potomac-Ohio and east of the Mississippi account for 65 per cent of the membership. The Contributing Members total 75. Members designated as Fellow number 482 in 1949. During 1950, the status of Fellow for having attained five consecutive years of membership will be reached by 76 members. To each new member the Secretary sends greetings, a copy of the N.C.G.T. Constitution, and a card to survey interests and teaching level. Professional Paper No. 9 has been distributed widely. The appointment of State Coordinators has been completed with the exception of Montana (since filled). Three "Travel Kits" of N.C.G.T. publications and activities have been used at educational meetings and conferences over the United States. The Kits are available on a loan basis. The cooperation of the State Coordinators has been an important factor in carrying out phases of the work of the Secretary and also of various committee projects.

Miss Pauline Schwartz, State Teachers College at New Haven, Connecticut, chairman of the Committee on Promotion of Field and Travel Experiences for Teachers, urged administrators to come to the meeting for the evaluation of travel and field trips to be held at Atlantic City. The crediting of travel and field trips is an important factor in advancing salary increments and ratings of teachers. By December 15, brief reports of programs of 1950 summer field trips and travel sponsored by colleges are to be ready.

Henry J. Warman, Clark University, chairman of the Committee on Survey of Research in Geographic Education outlined the objectives of the Committee and reported on the work accomplished. (This Report has since appeared in the JOURNAL, December 1949, pp. 390-391.)

Miss Edna Eisen, Kent State University, chairman of the Committee on Preparation of Bibliographies and Lists of Reading Materials, Their Source and Use, reported on the status of work and had available for all present lists of books, magazines, and recreational reading.

Mrs. Katheryne Thomas Whittemore of the New York State College for Teachers at Buffalo, chairman of the Committee on Preparation of Bibliographies and Lists of Maps, spoke on "Facilitating the Use of Maps."

President Shaw then announced the appointment of chairmen to the following committees: Tests, Miss Viola Bohn of Bismarck, North Dakota; Standards of Teacher Preparation and Certification, Miss Ina C. Robertson of Valley City, North Dakota; and

Geographic Education in Secondary Schools, Dr. Lillian Worley of the University of Tennessee at Knoxville. .

The Resolutions Committee presented the following report and moved that it be accepted. The motion was accepted and carried.

#### REPORT OF THE RESOLUTIONS COMMITTEE

The Resolutions Committee presents the following resolutions to the National Council of Geography Teachers assembled in Cleveland, Ohio, November 25 and 26, 1949.

Be It Resolved that the National Council of Geography Teachers express appreciation:

To the Committee on Local Arrangements who so effectively arranged accommodations for the meeting and to the Hotel Cleveland and its staff.

To those who sponsored the tea: Departments of Geography of Kent State University, Oberlin College, and Western Reserve University.

To the President, Dr. Earl B. Shaw, for his leadership during 1949 and for the inspiring program enjoyed at Cleveland.

To Dr. Gilbert Grosvenor for the delightful and stimulating address and to the National Geographic Society for the rare opportunity to see the moving picture of the Nepal Expedition, and to Mr. Volkmar Wentzel, for the effective narration, which carried us with him to Nepal.

To the donor of the JOURNAL prizes for the generosity that brings benefit to the JOURNAL OF GEOGRAPHY, that rewards writers and that, thru the gracious naming of the prizes, compliments others that have contributed much to geography teaching.

For work on the new volume in the Geographic Education Series, *Geography in the High School*: to the High School Committee (Zoe E. Thralls, Elizabeth S. Lichton, Harry O. Lathrop) for selection and arrangement of material; to the Publications Committee (Melvina Svec, Loyal Durand, Jr., Henry Warman) for seeing the volume thru the press; to George J. Miller, who initiated the series and planned the earlier volumes, for his guidance; to McKnight and McKnight for continued cooperation in the Council's publication program; and last but not least, to the authors, each of whom, at some time in his busy career, paused long enough to write an inspiring or practical article for the JOURNAL OF GEOGRAPHY and thereby made the volume possible.

Be it further resolved that:

The National Council of Geography Teachers express to the family of Mark Jefferson its sympathy for their loss and its appreciation of the contributions of Professor Jefferson to the teaching of geography thru his papers and articles but especially as a great teacher who gave inspiration to other leading geographers of today. Second and third generation geographers give evidence of his work.

The National Council of Geography Teachers express to the family of Wallace W. Atwood its sympathy and its feeling of a community of loss. Dr. Atwood's pleasant and kindly personality and his broad concept of the challenge of our profession have directly inspired thousands of the geography teachers of America. His writing and administrative contributions have extended the horizons of geography in education. We value the memory of a great leader.

The National Council of Geography Teachers express to the family of W. Elmer Ekblaw its sympathy and its appreciation of the broad contributions of Dr. Ekblaw to our understanding of earth and man. Thru his breadth of interests and knowledge, his warmth of friendship and force of enthusiasm, and his masterful command of our language, Dr. Ekblaw has made a valued, indelible imprint on the teaching of geography in America.

The Resolutions Committee moves that these resolutions be adopted and printed in

our JOURNAL and that Secretary Svec be instructed to send appropriate letters to the individuals and organizations.

NORMAN CARLS

ETHEL TATHAM

KATHERYNE THOMAS WHITTEMORE,

*Chairman*

The formal report of the financial status of the National Council was not given due to the unavoidable last minute absence of the Treasurer. However, President Shaw reported that the mounting costs of publication of the JOURNAL incurred a deficit of more than \$1500 for the fiscal year 1948-1949. Ways to remedy the situation were discussed. No action was taken as further study is needed.

Miss Zoe A. Thralls of the University of Pittsburgh, chairman of the Nominating Committee, presented the slate of candidates for 1950-1951:

*President:* Loyal Durand, Jr., University of Tennessee, Knoxville

*First Vice-President:* Harry O. Lathrop, Illinois State Normal University, Normal

*Second Vice-President:* Villa B. Smith, John Hay High School, Cleveland, Ohio

*Secretary:* M. Melvina Svec, State Teachers College, Oswego, N.Y.

*Treasurer:* John H. Garland, University of Illinois, Urbana

*Executive Board Members:* John W. Morris, University of Oklahoma, Norman; Mary Viola Phillips of New Kensington High School, Penna., Katheryne T. Whittemore of N.Y. State College for Teachers, Buffalo.

It was moved and seconded that the Secretary be instructed to cast the unanimous ballot for the candidates. Motion carried.

"Prospects for 1950" was the topic of the remarks made by President-elect Loyal Durand, Jr., who will assume office on February 1, 1950. He commended the high standards and accomplishments of the present administration under Dr. Shaw, and observed that the attendance at the meetings justified the National Council's having its annual convention alone rather than in conjunction with other groups. He observed that the geographers are a unified group.

The meeting adjourned at three thirty o'clock—closing the meetings of the thirty-fifth year.

Signed,

M. MELVINA SVEC, *Secretary*

## A GRADUATION PROGRAM WITH GEOGRAPHY AS THE CORE THEME\*

HENRY J. WARMAN

Clark University

Graduation exercises and the preparation for them can be both welcome and arduous tasks. Some graduations are prepared with no thought toward a central motive, while other graduation exercises are the culmination and climax of thoughtful preparation and discriminating guidance. For the efforts expended on the latter the rewards are many. The pupils are motivated and do their best work since a "day" is coming when their work will be on display and their performances audienced by those who are nearest them—the parents, teachers, and friends.

The following program represents what a geography centered program may be like. This program *has* been worked, applauded, and might well be emulated, not only in geography but also, with modifications, in English, History, Music, Arts, and even in some of the Physical Sciences.

### DOWNING STREET SCHOOL GRADUATION PROGRAM CLASS OF JUNE, 1949

Processional .....	Class
Welcome .....	Mario J. Papale
Geography .....	Joanne E. Kapulka
Month of May .....	Class
Geography and Music .....	Elaine F. Willette
Four Leaf Clover .....	Class
Sing, Sing, Birds on the Wing .....	Rita I. Cox
Geography and Horses .....	William W. Warman
To a Wild Rose .....	Mixed Chorus
The Green Cathedral .....	Girls' Chorus
Geography and the Westward Expansion .....	Richard J. LaPlante
Ho! Westward Ho! .....	Class
Geography and the Airways .....	Donald S. Inglis
Presentation of Diplomas .....	
.....	Dr. Henry J. Warman, Professor of Geography, Clark University
Farewell .....	Mario J. Papale
Star Spangled Banner .....	Guests and Chorus
Recessional .....	Class

\* The writer had the pleasure of participating in and witnessing this program and has prevailed upon the sponsor Miss Mary Ward, 8th Grade Geography Teacher of the Downing Street School, Worcester, Massachusetts, to agree to publication of this article.

The third item on the program "Geography" was a short informative talk on concepts of geography and an explanation of what the program was intended to do. It was a preparation for the program which the audience was about to enjoy. It may be noted that the songs—Month of May, Four Leaf Clover, Sing, Sing, Birds on the Wing, To a Wild Rose, The Green Cathedral, Ho! Westward Ho!—dealt with nature: the seasons, the vegetation, animals, the air, and movements of people. The walls of the auditorium were lined with pictures of birds, flowers, animals, planes in flight, and artistic representations of song ideas.

The speeches had been prepared by the pupils and research for the information took considerable time. The organization of the paper, the vocabulary, and the actual practice in delivery were started at least four weeks before the exercises. "Geography and Music," the fifth item on the program, was a delightful story completely memorized of Sibelius and his rather somber music. The piece Finlandia was pointed out particularly. The closing sentence of the talk was a jewel, "Maybe I haven't proved anything, but it's been fun trying." The talk on "Geography and Horses" traced the evolution of the animal as well as his distribution over the earth. His usefulness and the fluctuations and sporadic distribution today were brought out clearly. Again the final line was rather well turned, "I believe the *horse* is here to stay." "Geography and Westward Expansion" did exactly what could be expected—it interwove the history of the United States with the landscape. Pupil-made maps were on exhibit. This patriotic little speech was followed by vigorous presentation of Ho! Westward Ho!

The culminating talk "Geography and the Airways" not only gave the young airplane enthusiast a chance to show his interest in and knowledge of planes, but it did more. For the closing paragraph made the audience realize how close together, in terms of hours, the peoples of the world had come. The geographer, in the main address, continued this theme and developed it before awarding the diplomas.

## A SIMPLE RAIN GAUGE

ELBERT E. MILLER AND ROBERT C. BURNHAM

University of Utah

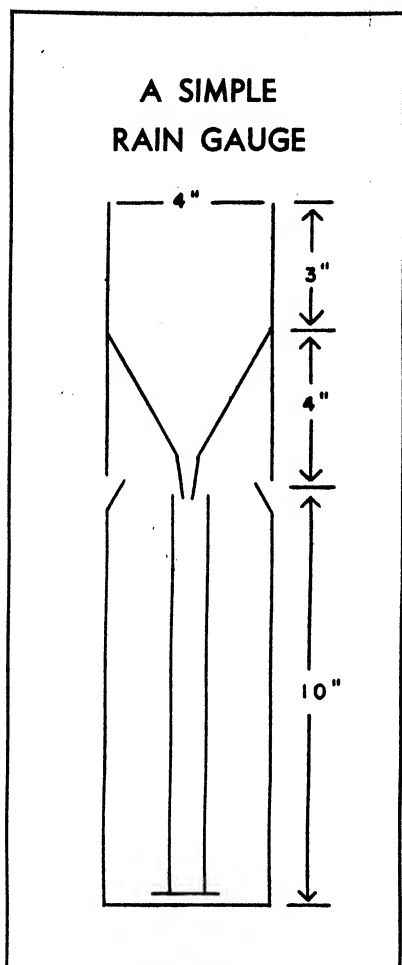
The problem of making a simple, yet efficient means of measuring rainfall at low cost is one that should interest all junior and senior high school or college teachers of geography, meteorology, or science. The Department of Geography at the University of Utah has devised one that meets all these requirements, costs less than two dollars, and can be made by a high school student. Practice in arithmetic is also gained from the project.

The materials required include three large, empty grapefruit or orange juice cans (those with the ridges around them are best), a tin-plated iron funnel four inches in diameter, a 100cc graduated cylinder, plus tin snips or can opener for cutting the cans and equipment for soldering the cans together. Because everything is already tin-plated, soldering is extremely easy.

In making the rain gauge, both ends are cut from one can and one end is cut from each of the other two. The funnel is slipped inside the can from which both ends have been removed. A small portion of the funnel may have to be removed with the can opener or tin snips if the funnel is too large, but the worker should try to leave a smooth edge as it will facilitate soldering. In order to prevent any of the rain from splashing out of the gauge as it strikes the funnel, we put the funnel down to the second ring on the can—a distance of three inches. This also allowed a small portion of the funnel to protrude from the bottom of the can.

Next, the open ends of the other two cans are soldered together and one of the cans cut off to leave the proper height for the base. The correct height will vary with the height of the graduated cylinder—just high enough so the funnel will enter the cylinder about an inch when the cylinder is inside the base can. (See illustration.) The base of our gauge is ten inches tall. The top edge of the base can is crimped with pliers to make it smaller so the top can will fit down over it. This prevents rain which runs down the outside from entering the base can.

In operation, the rain gauge is set in an unprotected location and the base is tied to a short stake to prevent its being overturned. It should be at least as far from buildings, trees, etc., as they are tall. Rain entering the gauge is led through the funnel into the cylinder. If precipitation is heavy, it will overflow the



cylinder into the base, but it can be poured back into the cylinder for measuring. Approximate measurements can be made with a ruler in the base without using the cylinder, thus cutting the cost of the gauge to about fifteen cents. Accurate measurements depend upon calculating the ratio of size between the open surface of the can and the surface of the cylinder, using the formula,  $AREA\ OF\ CIRCLE = \pi \times R^2$ . Thus if the open end of the top of the gauge is four inches in diameter and the inside of the cylinder is one inch in diameter, the ratio of their areas is 1:16 and one inch of rain will make sixteen inches in the cylinder. Calculations can also easily be made to secure a constant, which, when multiplied by the number of milliliters of water will give the inches of rainfall. In our gauges, multiplying the number of milliliters of water in the cylinder by 0.00453 gives us the number of inches of rain. No measuring is necessary. This figure will vary with the size of the cylinder, gauge.

The gauge should be read daily if there is rain, to prevent loss by evaporation. Or, a few drops of light motor oil can be added to the cylinder. This will prevent loss by evaporation and the level of the water in the cylinder can be read at the lower edge of the oil.

A record should be kept of precipitation and totals made at the end of each month. When there is danger of freezing, the cylinder can be left out of the instrument, and ice can be melted from the base can. Then measure by pouring the water into the cylinder. During periods of drifting snow, measurements will not be so accurate. Best results will be obtained if the cylinder and top of the gauge are left off and snow is collected and melted in the base. Comparison of snow depth in the base and on the ground nearby will indicate to the observer the accuracy of his readings during the storm.

## CREATIVE WORK IN GEOGRAPHY

GUY MINADEO

Academy High School, Erie, Pennsylvania

Salt and flour relief map-making affords students of geography an excellent opportunity for creative work which may be undertaken individually or collectively. In the making of individual maps each student is supplied with an 8" by 11" sheet of cardboard. The back of a tablet may also be utilized, altho relief maps for best results should not be too small. On the cardboard is traced the outline of the map which is to be made. Each pupil is then supplied with a mixture of salt and flour in the ratio of two parts of salt to one part of flour by volume. Water is added and the mixture is stirred until it has the consistency of mortar. The pupil then spreads a layer of paste, about one-eighth of an inch thick, over the entire map. This first layer represents lowlands; the base of the map represents sea level. The highlands should then be built up in layers approximating one-eighth of an inch in thickness, and the number of layers to be added depends upon the altitude of the highlands. Care must be taken to allow each layer to dry thoroly before applying the next. Mountains and plateaus may be built true to scale, about 32,000 feet to the inch. Stake the cardinal points by driving into the base common, straight pins, adjusting the heights of the pins above the base so that you can build just above the tops of the pins to the required height. By this procedure the map is also reenforced. After the map hardens it may be painted with water colors, using the universal scheme of colors for showing relief. Individual maps are better if confined to one continent, a state, or group of states, a country, a county, or even a city or township.

A relief map of the world was made as a group project carried out by an eighth grade class. A piece of beaver board 4' x 6' was used as a base. A good world map was traced on it by means of carbon paper. Then the entire outline was covered with a thin layer of the salt and flour mixture. After this layer had been placed on the map, the pins for scaling were driven into the required height, using a scale of 32,000 feet to an inch. A good ruler was used to get the measurement as correct as possible. After the first layer was thoroly dry, the lakes, rivers, plateaus, and mountains were drawn on the map with colored pencils. The lakes and rivers were carved out to show a depression, while another layer was added to the plateaus and mountains. The work from here on was building layers, and marking in the remaining mountains

which are required, until the entire map was completed and ready for the paint brush.

In this type of learning situation the children are watching the world take form thru their own creative effort. The emphasis is entirely upon spontaneous child-activity and learning by doing. Map study, in particular, and all phases of geography, in general are made extremely interesting. In regard to objective achievements, tests showed that the classes working on map projects more than held their own with the classes using textbooks and reference materials; altho those using textbooks and reference materials, apparently spent much more time in study than did the classes working on the projects.

Learning exercises of this kind give a creative outlet to the class. Each individual has the opportunity to express originality, and in doing so contribute a share to the whole. The brighter pupils have an opportunity to show their leadership and organizational ability. The slower pupil has a chance to show his capabilities in the form of manual dexterity and artisanship.

The children were much happier and more interested in this type of learning activity than in other types. There is no doubt in the author's estimation that the following concepts of geography can be more efficiently and interestingly taught by this method: 1. General world relief; 2. Comparative size of continents; 3. Comparative size of oceans and bodies of water; 4. Latitude and longitude of cardinal points of interest; 5. Ocean currents; 6. Climate—thru coordinating winds and currents; 7. Relative location and distance between countries; 8. Altitude; 9. Products and transportation lanes.

This list contains common outcomes, but further consideration should be given to the fact that in working on this project, the child is put into a real life-situation of cooperation and civic pride. The project can readily acquaint the pupils with an interesting and educational hobby, as these maps can be made easily at home. The materials are so inexpensive that the hobby is within reach of all. The projects are not limited to map making alone, but may include such projects as building a framework of Niagara Falls and Gorge; of the Grand Canyon; of a drainage system; and of divides. Local topographical features with which the pupil is acquainted make equally interesting projects.

## THE NATIONAL COUNCIL AT WORK

The following eighteen committees of the National Council of Geography Teachers are at work during 1950. The chairman of each committee, and the address of the chairman is listed first. Communications and suggestions from members of the National Council are welcomed at any time by the committees.

1. *Committee on the Distinguished Service Award.* Alison Aitchison, 508 Seerely Boulevard, Cedar Falls, Iowa; George B. Cressey, Harry O. Lathrop, J. Russell Whitaker, Otis W. Freeman, Loyal Durand Jr., M. Melvina Svec.
2. *Planning Committee.* Mrs. Katheryne T. Whittemore, Department of Geography, New York State College for Teachers, Buffalo, New York; Thomas F. Barton, Alice Foster.
3. *Publications Committee.* M. Melvina Svec, Department of Geography, State Teachers College, Oswego, New York; Loyal Durand, Jr., Henry J. Warman.
4. *Director of Public Relations.* J. Warren Nystrom, Department of Geography, University of Pittsburgh, Pittsburgh 13, Pennsylvania.
5. *Committee on Inquiries.* Zoe A. Thralls, Department of Geography, University of Pittsburgh, Pittsburgh 13, Pennsylvania.
6. *Research Committee.* Lillian Worley, Department of Geology and Geography, University of Tennessee, Knoxville 16, Tennessee; John Garland, Clyde Kohn, Zoe A. Thralls, Earl B. Shaw.
7. *Committee on Survey of Research in Geographic Education.* Henry J. Warman, School of Geography, Clark University, Worcester, Massachusetts; F. K. Branom, Otis W. Freeman, Ruth H. Stanley.
8. *Committee on Geographic Education in the Secondary School.* Lillian Worley, Department of Geology and Geography, University of Tennessee, Knoxville 16, Tennessee; Halene Hatcher, Ina C. Robertson, Frances M. Hanson, Flora Dutcher.
9. *Committee on Aviation and Geography.* Richard L. Tuthill, Department of Geography, University of Kentucky, Lexington, Kentucky; A. K. Botts, Clifford MacFadden, John W. Morris.
10. *Committee on Compilation of Suggestions and Bibliography for Use by Curriculum Committees.* Mamie L. Anderzhon, 112 North Marion Street, Oak Park, Illinois; Annice D. Elkins, Monica Kusch, Villa B. Smith.
11. *Committee on Color Transparencies.* Elizabeth Eiselen, Department of Geology and Geography, Wellesley College, Wellesley 71, Massachusetts; Adelaide Blouch, Fred Dohrs, Carol Mason, Marion Wright.
12. *Committee on Preparation of Lists and Bibliographies on Motion Pictures for Geography Teaching.* Thelma Waddle, Board of Education, Pittsburgh Public Schools, Pittsburgh, Pennsylvania; E. E. Hall, Lavina Henderson.
13. *Committee on Preparation of Bibliographies on Lists of Maps.* Mrs. Katheryne T. Whittemore, Department of Geography, New York State College for Teachers, Buffalo, New York; Margaret Chew, George Corfield.
14. *Committee on Preparation of Bibliographies and Lists of Reading Materials, Their Sources and Uses.* Edna Eisen, Department of Geography, Kent State University, Kent, Ohio; Lyda Belthuis, R. W. Frank, L. Isenogle.
15. *Committee on the Preparation of Lists and Bibliographies on Still Pictures.* Mary Jo Read, Department of Geography, State Teachers College, Milwaukee, Wisconsin; Byron Barton, Mary Beecher, Cyril Stout.
16. *Committee on Standards of Teacher Preparation and Certification.* Ina C. Robertson, Department of Geography, State Teachers College, Valley City, North Dakota.

17. *Committee on Tests.* Viola M. Bohn, 110½ Avenue C, Bismarck, North Dakota.  
18. *Committee on Promotion of Field-Travel Experiences for Teachers.* Pauline Schwartz, Department of Geography, State Teachers College, New Haven, Connecticut; Adah Flemington, Paul Kinsel, G. Etzel Percy, W. Watterson.

Professor Clyde Kohn, who edited the 19th Yearbook, *Geographic Approaches to Social Education*, for the National Council of Social Studies reports that the yearbook is available in quantity for class use. The fine reception of this yearbook has been gratifying.

LOYAL DURAND, JR., *President*

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## EDITORIAL NOTES AND NEWS

Why isn't more experimental work on the problem of teaching geography in the United States going on at present? Are elementary and high school teachers too busy? Do geographers in teachers colleges and colleges of education have time for research or is their teaching load too heavy? If funds are needed, do teachers know about the Research Committee of the National Council of Geography Teachers and the funds under its management? How many awards did this committee grant last year? You recall that the purpose of the awards is (1) to promote training in geographic research, (2) to increase knowledge of the problems of geographic education and to seek solutions of such problems, and (3) to encourage research in geographic education in the educational institutions of our country.

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By invention and use of machinery man is constantly attempting to overcome handicaps of the physical environment. India is now buying American heavy tractors in order to destroy kans grass. This gigantic weed-grass now occupies about three million acres in central India and makes the land at present unfit for cultivation. The Indian animal-powered plows are unable to budge this heavy grass. Not only is kans grass prolific but it has an enormous root system. The roots are seven feet long and near the surface of the ground about two inches in diameter. The only way to kill this weed is to pull it out of the ground and dry the roots in the sun. As quickly as approximately 350 tractors clear the fields of the kans grass, the land will be plowed and planted. If the seven-year campaign in central India is successful the same tractor methods will be used on remaining millions of acres of farmland still preempted by kans grass, the giant weed intruder of India.

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According to a Twentieth Century Fund Survey, flood losses in the United States in recent years have averaged over \$110 million annually.

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DR. HANS LUNDBERG estimates that the airplane has made prospecting 500 times faster and, 100 times cheaper.

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In spite of man's rapid advancement in technology the oceans still remain challenging barriers to transportation and communication. At the present time television is unable to cross oceans. Consequently, its only land route to London, Paris and Berlin is northwest thru Alaska and Russia.

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According to reports from Russia the "nest method" of tree planting is being used extensively there. In contrast with individual plantings followed in the United

States, the nest method involves the planting of seedlings in a small circle. Advocates of this method claim that experimentation shows that there is no conflict among seedlings and that a higher percentage live because they protect each other from weeds and grass.

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I. W. WANDER, Citrus Experiment Station, Alfred, Florida has discovered the cause of water-repellent soil in Florida citrus groves. These soils which remain dry even after prolonged rainy periods form from the union of magnesium in commercial fertilizers with an undetermined fatty acid in the soil. The big handicap to the solution of the problem is that the fruit trees need the magnesium.

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Volume VII, Number 1 of the *Geographic Quarterly* issued by the Department of Geography, Austin Peay State College, Clarksville, Tennessee has arrived. Harry L. Law is the editor.

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It is reported that over nine million persons are employed in about one half million separate business firms connected with the automobile industry. If true, about 15 per cent of all our gainfully employed people are connected with this basic industry.

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Word comes from Brazil that the Anderson, Clayton and Co., United States cotton firm has bought "great areas of land" in the Brazilian state of Mato Grosso with offices already set up in Campo Grande. Machinery and equipment are being imported into Brazil for complete mechanization of cotton farming on the new plantations.

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The presence of five coveys of 125 gambel quails in the Lemhi drainage area of Idaho poses an academic question for sportsmen, wildlife experts and others interested in conservation. The typical habitat of gambel quail are the deserts of the Southwest. These plump, fast desert birds are supposed to be non-migratory and yet they are far away from their native home. Officials in the Idaho Game Department hope the birds will stay and multiply.

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It is reported that electric output in the United States increased 58 times from 1902 to 1940.

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How many teachers either avoided or failed to distinguish clearly for their pupils this fall the difference between dew, frost, rime and ice storm? Frost is not frozen dew since dew is water. Frost is formed from moisture passing directly from a gaseous to a solid state. Rime forms from freezing fog or mist and is feathery in structure. Glaze or ice storm is due to light rain freezing to colder objects at the earth's surface forming ice.

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About six score or one hundred and twenty years ago James Carter proposed that geographic instruction should begin with a study of the home environment rather than of the solar system.

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During 1949 Baía, Brazil celebrated its 400th birthday. This settlement which later became the first capital of Brazil was established nearly three-quarters of a century before the Pilgrims landed at Plymouth Rock.

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A Twentieth Century Fund study estimates that nearly 20 per cent of the goods

consumed in this country in 1850 were imported as compared with a little more than 10 per cent in 1880 and 6 per cent in 1937.

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Is it possible to teach fifth and sixth grade children in the United States how to read the topographic maps prepared by the United States Geological Survey? Has any objective scientific research been conducted in the United States? One of the three really large-scale experiments ever carried out in Britain on the teaching of geography involved 40,000 children and contour lines. The experiment attempted to discover the age at which children could realize what contour lines represented. Professor N. V. Scarfe in summarizing the results of the experiment writes, "The results tended to suggest that before the age of 10½ teaching of contour lines was not likely to be well suited to children's intellectual capacities. This confirmed the practical experience of teachers for such teaching had for years normally begun at 11. The war unfortunately put a stop to this fruitful and useful type of research into the age at which the various forms of map work should naturally be introduced."

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Do you agree that "geography in the past has suffered because we have had regard to what we think children ought to know when they become adult, and not to what children want to know when they are young?"

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One of the leading oil companies now has an engine in the experimental stage that will burn a wide variety of fuels without knocking. The principal involved is an air swirl in the cylinder which keeps the fuel from being ignited at the wrong time. This swirl works equally well with diesel-type and spark-ignition type engines. Fuels with octane and centane ratings between 0 and 100, and also such fuels as alcohol, benzene, kerosene, diesel fuel, tractor fuel, isopentane, and triptane can all be used in this revolutionary type engine. The only variation in engine operation in changing from one fuel to another is in the power output, which varies with the heating value of the fuel. If such an engine is developed commercially the results will be far-reaching. The trend would be away from the development of high octane fuels, and at the same time the percentage of crude oil usable for motor fuels would be increased from the present 54 per cent to an estimated 71 per cent.

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The Division of Geography, Pennsylvania State College, has established a "Geographical Kodachrome Service" thru which it is making available for teachers approximately one thousand 2 x 2 slides. These slides cover selected areas of Alaska, Canada, United States and Mexico. A catalog has been prepared from which a selection may be made. These slides are for sale only. For detailed information, address Geographical Kodachrome Service, 200 East Irvin Avenue, State College, Pennsylvania.

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The Virginia Geographical Society will hold its third annual meeting on April 22 at the Centerville School, Fairfax County, Virginia. President Hanson writes that they are trying an experiment this year by holding the meeting in the Centerville School other than a college or university. Among the major papers to be presented are the following:

"How to Use and Interpret a Map" by Raus M. Hanson; "Overview of the Actual Use of Maps in the Classroom—The Practical Side" by Mr. John Webner, Principal of Bailey's Elementary School, Fairfax County; Films (1) "How to Read a Map" for Primary (2) "Maps and Pioneers" for all grades by Col. S. P. Poole, Virginia Geographical Institute. In addition, Margaret Parrett of the Lee Jackson School will give a "Demonstration of Teaching Geography." Two three-hour tours will also be provided.

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The 1950 officers of the Nebraska Council of Geography Teachers are: President, Mr. N. R. Diffenderfer, Nebraska State Teachers College, Kearney; Vice-President, Mr. John

M. Moulton, Hastings College, Hastings; Secretary-Treasurer, Miss Irma Warta, University Extension Division, Lincoln; Bulletin Editor, Miss Esther S. Anderson, University of Nebraska, Lincoln; and State Coordinator, Mr. John F. Gaines, University of Nebraska.

Miss Olga Anderson, Beatrice; Miss Dorothy Bell, Fremont; Mr. Fred G. Dale, Wayne State Teachers College; Mr. N. R. Diffenderfer, Nebraska State Teachers College, Kearney; Miss Flora Dutcher, McCook; and Mr. Lawrence L. Stofan, Alliance, are District Vice-Presidents.

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At the recent meeting of the Association of North Dakota Geographers the theme was High School Geography. The following topics were discussed by three panels: Course of Study; Textbook Evaluation; and Making Geography Live. The association sponsored a field trip to Bald Hill Dam on the Sheyenne River. Present officers of the organization are: President, Wensel W. Moberg, North Dakota Agricultural College, Fargo; Vice-President, Bernt L. Wills, University of North Dakota, Grand Forks; Secretary, Miss E. Helen Iorns, Department of Public Instruction, Bismarck; Treasurer, Melvin E. Kazeck, University of North Dakota, Grand Forks; State Coordinator, Ina C. Robertson, State Teachers College, Valley City; and Editor of the ANDG Bulletin, Viola M. Bohn, Geography Instructor, Bismarck City Schools.

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The Nebraska Council of Geography Teachers was organized over thirty-five years ago on November 9, 1914. It has published a bulletin since October, 1926 (World War II years excluded). Do you know the history of your state council, club or association and its publications?

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Present officers of the Texas Council of Geography Teachers are: President, Dr. E. M. Scott, Sam Houston State College, Huntsville; Secretary, Miss Hazel P. Zorn, Burkeville; and Coordinator, Mr. T. Taylor Brown, East Texas State Teachers College, Commerce. The program of the recent meeting consisted of three lectures: Dr. W. T. Chambers, Stephen F. Austin State College, spoke on Teaching Geography in the Grades; Dr. E. M. Scott talked on English Countryside, and Mr. Taylor Brown reported on Progress in Geography in the Elementary School.

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Do you have a copy of "Forest Resources of the World" by the Division of Forestry and Forest Products of the Food and Agriculture Organization of the United Nations?

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As teachers, we often wonder just how effective and enduring our teaching efforts have been. If you need a "lift," read the essay entitled "Conservation of Our Soil Resources" written by Wilfred M. Schutz, a high school student, and published in the February, 1950 issue of *Soil Conservation*. This essay won first place in a nation-wide essay contest and brought Mr. Schutz an automobile.

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The 1950 officers of the Indiana Council of Geography Teachers are: President, Daisy S. Buttgen, Clinton; Vice president, Gertha Sturgeon (northern Indiana); Benjamin Moulten, Butler University, Indianapolis (central Indiana); James L. Guernsey, Indiana State Teachers College, Terre Haute (southern Indiana); Secretary-Treasurer, Floy Hurlbut, Ball State Teachers College, Muncie; and Coordinator, John C. Finney, Anderson High School, Anderson.

Dr. Joseph A. Russell, Chairman of the Geography Department, University of Illinois, was out-of-state guest lecturer at the Indiana Council's last program meeting held in Indianapolis. His lectures were Geography and the Future of Japan and "How Your Classes Can Study Industrial Geography."

## GEOGRAPHICAL PUBLICATIONS

Francis P. Shepard, **Submarine Geology**. Harper & Bros., New York, N.Y.  
\$6.00

Here in textbook form for the first time is presented the subject matter of Oceanography, a new and active branch in the science of geology. The author presents the book with the frank admission that he does not have all the answers, but is merely presenting the results of a tremendous amount of research all of which has only scratched the surface in the realm of submarine geology. To the findings of older authorities in the field, the author has added his own experiences combined with the research of a great number of his peers. As a result, the topics in the book are dealt with quite thoroly if not exhaustively.

The first two chapters deal with introduction, history, and a discussion of equipment and methods used in exploration of the ocean floor. The subject matter of submarine geology starts with the third chapter. Waves and currents are treated first, and in the succeeding chapters the discussion proceeds in a natural manner thru the marginal zone of the ocean to the treatment of the floors of the ocean deeps. In the discussion of the marginal zone of the ocean, the author presents his proposed classification of Sea Coasts, and Shorelines.

At the end of each chapter there follows a summary of the present knowledge of the topic discussed in the chapter. Whenever controversy exists, a discussion of the conflicting hypotheses is presented. A good example is the discussion of the origin of coral reefs, where the Darwin Subsidence theory, and the Daly Glacial Control hypothesis are discussed and followed with the author's own conclusions on the development of coral reefs.

In the final chapter there is a summation of the material presented in the book, followed by a discussion of the possible useful application of the data of submarine geology. Here, the significance of glaciation in the production of distinct types of continental shelves, the petroleum possibilities on continental shelves, and the tectonic significance of continental slopes are discussed.

The book is very well planned. The type is of a size which permits easy reading, and finally, the material is so presented that it makes very interesting reading.

*Indiana University*

CHARLES J. VITALIANO

Kohn, Clyde, Editor, **Geographic Approaches to Social Education**. 299 pages, National Council for the Social Studies, 1201-16th St., N.W., Washington 6, D.C. \$3.00.

In recent years the terms social studies and social education have been used increasingly to describe a method whereby the subject-matters of history, geography, civics, economics, and the like have been combined and utilized as the means of helping students better understand themselves and their relationship to the complex environmental forces which condition their growth and development. The use of these terms has resulted in a good deal of confusion. Parents have complained that the schools are failing to teach their children history, geography, and civics as these subjects were taught when they went to school. Teachers, themselves, have been a bit confused and have fumbled a good deal in their efforts to achieve a more effective method of teaching without sacrificing the significant contributions that each one of the social studies should make to the education of their students.

The Nineteenth Yearbook of the National Council for the Social Studies should do much to dispel this confusion. The authors of the Yearbook are not starry-eyed educational theorists. All of them are reputable and recognized authorities in the field of

geographic education. While they offer no single pattern or program of organization and procedure they indicate clearly that the study of geography has value only to the extent that it contributes directly and significantly to social understanding and social competence.

The Yearbook presents the entire field of geographic education within a framework of goals that are common to all social education. Geography is no longer seen as an accumulation of facts and statistics about the earth. It is seen in proper perspective as an integral part of man's human problems, his culture, his history, his science, his technology, his resource use—in short as a contributing factor to a more comprehensive and useful understanding of man and the planet on which he lives.

At no point does the Yearbook interpret geography as an unrelated part of the curriculum. It is interpreted consistently as a vital part of all aspects of the curriculum with the basic goals of social education permeating the entire treatment.

The identity of geography as a science worthy of its place among the sciences is nowhere lost. All of the basic knowledges and skills are recognized for their full value but are achieved within a unified framework of an education which sees them for what they can contribute to man's good thru use rather than the mere accumulation of academic facts.

The Yearbook should be particularly helpful to elementary and secondary teachers. It presents first an excellent treatment of the general goals and objectives of Geographic Education and does it in a lively vital fashion. The more specific objectives are next explored with practical implementation suggested thruout. The tools to attain these goals are next presented with very useful suggestions as to their place in the curriculum. The latter part of the book considers the implications of all this for the curriculum in the elementary school, the secondary school and teacher training institutions.

This Yearbook should be widely used in pre-service and in-service programs of teacher education. It would do much to clarify a good deal of existing confusion and would contribute most effectively to improved teaching of the social studies.

*Superintendent of Schools  
Glencoe, Illinois*

PAUL J. MISNER

Jeannette Mirsky, **To The Arctic! The Story of Northern Exploration** from Early Times to the Present. 334 pages. Maps and photographs. New York, Knopf, 1948, \$5.00 net.

Contemporary strategic emphasis on the Arctic region is reflected in increased popular interest in the area. Teachers of geography could formerly, like the makers of Mercator maps, leave most of the polar regions out of consideration. They must now be prepared to answer questions not only about the first journey to the North Pole, but also about the Soviet Northern Sea Route, agriculture in Alaska, weather stations in Greenland, new maps of northern Canada, and many other remote developments.

*To the Arctic!* is the best available source book on the opening up of the northern regions, from the days of Ancient Greece to modern polar flights. The author's approach is both historical and regional; that is to say, she traces the exploration of the Far North from the earliest times, but does it by areas such as North America, northern Russia, and Greenland. Her facts have been carefully checked, and this reviewer has detected no errors in them. She has used freely the actual words of explorers who have published reports, has reproduced illustrations from the original books, and has also provided new maps drawn to show the more important expedition routes.

*To the Arctic!* has three useful appendices, of which the third, dealing with the chronology of northern exploration, is especially valuable. References are grouped together at the end under the twenty-one chapter headings. These provide an adequate bibliography for anyone wishing to read original source material on the North.

In his introduction, Dr. Vilhjalmur Stefansson points out that the first edition of this work (it appeared under the title, *To the North!* in 1934) was ahead of its time, in that the public was not then alert to the great contemporary significance of the Arctic. That early edition was, interestingly enough, withdrawn shortly after publication because of a libel action threat by the late Dr. Frederick A. Cook, upon whose reported polar travels Miss Mirsky cast certain doubts.

Students and teachers of geography anxious to be fully informed about the background of current events in the North should certainly read *To the Arctic!* Having done so, they will undoubtedly continue to make frequent reference to it as an accurate and detailed source of geographical and historical information.

*Dartmouth College*

TREVOR LLOYD

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## NEW PUBLICATIONS

Erich H. Jacoby. **Agrarian Unrest in Southeast Asia.** 287 pp. Columbia University Press, New York. 1949. \$4.00.

The author endeavors to show the relationship of agrarian unrest to the economic conditions that prevail in Southeast Asia. He develops the importance of economic diversification in the future development of the region. The area is treated by regions, so that one may readily utilize the results of his study for a particular country, e.g. Java or Siam.

Birch, T. W., **Maps,** Oxford University Press, 114-5th Ave., New York 11, New York. 1949. 238 pages, 99 illustrations. \$4.00.

While this volume was developed particularly for use in the schools of England, it should be available to American students in all of our libraries. It is an account of topographical and statistical mapping. Modern maps are treated to considerable length and preparation is centered around the instruments involved. The volume concludes with chapters dealing with map reading and geographical interpretation of landscapes. Part II deals with statistical maps, the preparation of graphs, and diagrams and diagrammatic maps.

Finch, Vernor C. and Glenn T. Trewartha, **Elements of Geography,** McGraw-Hill Book Company, Inc., New York. 1949. 711 pages, 452 maps, 8 plates. \$6.00.

This is a thoroly revised edition of the well-known text by the same authors. Part I deals with the physical elements of geography and Part II with the cultural elements of geography. The treatment differs from the usual form by starting out with the discussion of climate and weather followed by land forms, and with earth resources. The college instructor will certainly welcome this new edition and high school teachers will find it a mine of information.

Cotton, C. A., **Landscape,** John Wiley & Sons, Inc., New York 16, New York. 1949. 493 pages, 375 figures. \$10.00.

This new edition has been materially revised and enlarged. Dr. Cotton certainly possesses the command of language that enables him to describe, in a very highly effective manner, the forces of Nature as those forces move over the landscape of the earth. This volume should be a standard reference in all libraries.

# *The* JOURNAL of GEOGRAPHY

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VOLUME XLIX

APRIL, 1950

NUMBER 4

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## AN APPRAISAL OF TEACHING GEOGRAPHY AT THE COLLEGE, UNIVERSITY AND GRADUATE SCHOOL LEVEL\*

LEWIS F. THOMAS

Washington University

### OBJECTIVES RELATED TO TYPE OF INSTITUTION

The teaching of geography at the college, university and graduate school level shares with some other subjects the inhibitions created by educational objectives of administrators or educational policies of constituencies. Different objectives characterize the Liberal Arts Colleges, Teachers Colleges, Universities and Graduate Schools. Different policies characterize liberal or conservative political, social, economic and religious constituencies.

The Liberal Arts Colleges include those numerous small to medium sized independent institutions whose objective is to educate students with a broad cultural program rather than with a specialized technical curriculum. Many have gained national publicity for their "personalized plans." In their zeal to bring out the potentialities of the individuals many minimize the content of subject matter. One commentator says that the classes are glorified "bull-sessions" where the students talk freely regardless of what they know about the topic. In many cases these objectives are a reaction to the failure of big universities to teach the individual.

The Teachers' College objectives logically are concerned with the "know how" of teaching. Most Teachers Colleges have lived down an early reputation of training students with "how" without any "know." Obviously it requires more than lesson plans, outlines, methods, objectives and results to train successful teachers. Content subject matter is just as essential. The good

\* Presented at the Cleveland meeting of the National Council of Geography Teachers, November, 1949.

Teachers' College graduates view with disdain the know-it-all who has no technique of presentation.

The University Department of Geography in general tends to emphasize specialization in knowledge of facts. Detail courses are offered for specialists in allied fields. Special courses by specialists are offered with mounting prerequisites for majors in geography. The over-all objective is to cram the students with facts and figures with little or no regard to intellectual digestion of those facts and figures. It seems to be assumed that there is some mysterious screening whereby the resulting university student possesses superior mental faculties and uses them. Without doubt the university effectively provides abundant information for its students by the cafeteria plan. The students look out for themselves.

The Graduate School Departments of Geography under the stress of the booming market for geographers are resorting to university undergraduate methods. The traditional close relationship between students and faculty is perforce abandoned for the run-of-the-department student and is reserved for the final polishing off of the survivors.

The liberal or conservative policies of some colleges, universities, and graduate schools determine both the content of geography and the methods of teaching geography. In the liberal institutions where freedom of thought and presentation are taken for granted, the teachers and students study the truth, pure and simple. In conservative institutions where certain political, religious or social creeds dominate the curricula, both teachers and students are intellectually restricted. The truth must be studied from the point of view of the constituency with proper high lights and shadows. In certain institutions it is not proper to be communistic, pro-labor, pro-capital, anti-labor, anti-capital, New Deal or Anti-New Deal, liberal or fundamental in religion. Even the procedure suggested by Preston James for handling controversial topics in February, 1949, *JOURNAL OF GEOGRAPHY* would not be good form or even tolerated in some institutions of higher learning. Disciplined learning and thinking are the rule.

The purpose of the preceding paragraphs is to suggest that there are many aspects to teaching geography at the College, University and Graduate School level. Also that within each of these aspects there are merits that the best teacher of geog-

raphy would embody a judicious mixture of the best of each. Certainly there is a great contrast between the teacher who is a sympathetic by-stander in a student free-for-all, and the teacher who says, "what a wonderful job teaching would be if there were no students." I doubt that the American public is willing to pay the salaries necessary to provide the ideal teacher, i.e., one who has a love for students, who has a knowledge of the subject, and who knows how to present his knowledge effectively.

#### CHARACTERISTICS OF STUDENTS

Let us turn our attention to the students we teachers have to deal with in higher education. Students in Colleges of Liberal Arts, majors in departments of geography in universities, and graduate students by and large study geography because they like the subject. Consequently, they have an excellent scholastic attitude which makes them good material to work with.

Students in Teachers Colleges and in departments of geography in universities where geography is required by a professional school such as Business, take geography because they must. By and large they have a poor attitude which is in terms of grade points and credit hours. Even for graduate degrees, the degree and not the training is the chief goal because it will assure a higher rating on some payroll or pension plan.

Assuming that students have a desirable attitude, their preparation varies greatly because of the differences in the educational programs of elementary and high schools. The battle between "whats" and "whys" reached one of its climaxes in two well-worded and well-thought-out articles by Douglas C. Ridgley in the JOURNAL OF GEOGRAPHY, May and September, 1926 entitled respectively, "The Necessity of Accurate Knowledge About Places," and "Twelve Hundred Selected Place Names." Whether we like it or not, there is a general mixture of geography, history, civics, economics, and sociology commonly immiscible. If there is any truth to the statement that memory develops best in youth, it seems that more attention should be paid to the easy acquisition of knowledge rather than the more difficult integration of knowledge.

This condition of pre-college geography has led to a collegiate teaching attitude which maintains that the students do not know anything. What most of these particular collegiate teachers mean

is that the students do not know where rivers, mountains, countries, and cities are located. They cannot name in order the chief producers of this and that commodity. They do not know many facts or definitions in meteorology, cartography, physiography, geology, pedology, botany, and zoology. In other words, high school graduates are not "quiz kids."

#### NATURE OF GEOGRAPHY

Personally I am not alarmed by this situation. In fact, I think that it marks a trend toward a sound core of geographic philosophy at all levels. I know that there are many college teachers who do not agree with me. One of the very interesting sessions at the 1948 meetings of the A.A.G. at Madison, Wisconsin, discussed geography courses in "the smaller departments of geography." One group advocated the thoro drilling in the basic elements of environment, as such, for the proper beginning of geographic study. Another group advocated the "totality of environment" represented by the term regional landscape. One of the things I have learned in about forty years of college teaching is the futility of telling a class that they should learn this bit of knowledge because sometime when they grow up they will find this bit of knowledge essential. As I indicated in a paper before this Council January 1, 1942, entitled "Geography Assignments at the College Level," students will dig up more information and remember it longer if there is some problem to be solved.

It seems to me that a desirable educational procedure would be to survey the subject as a whole at the beginning in order to recognize the component parts and aspects. The story of the four blind men and the elephant is very pertinent. A student could study the leg of the elephant with scientific techniques in great detail and learn a great many valuable facts without having the vaguest concept of the elephant as a whole. So in geography landforms are as important as legs to an elephant. Yet a student could become an expert in landforms without the slightest concept of what geography really is. Let us introduce our students with a college-university level challenge to the world landscape as a whole. Then a student would be able to recognize the geographic features of the earth's surface and their relationships to each other. Then, if the student is particularly interested in geographic legs, or tails, or trunks, or ears, he can specialize to his mind's

content with an understanding of the over-all significance of his work. The pursuit of systematic specialization in a geographic unit creates new fields of study, which tends to disrupt the unity of geography and is centripetal in its effects.

If one glances thru textbooks on "The Teaching of Geography," published about forty years ago, one sees a diagram of a large circle intersecting several other circles labeled with the names of several sciences. The center of the large circle is labeled geography. The explanation states that there is really no such thing as pure geography, it is just a "confederacy" of a large number of subjects. Some people even refer to geography as the hole in the doughnut.

Today there is accepted by many geographers the idea that geography is concerned with the study, description, analysis and explanation of an area whether that area be the world as a whole, or provinces, regions, or districts. That area is a unit and as such benefits by centrifugal forces which integrate and coalesce the various elements. This concept of the core of geography binds itself to the proper objective of higher education—wisdom.

Wisdom is defined by Webster as: "Quality of being wise; ability to judge soundly and deal sagaciously with facts especially as they relate to life and conduct; knowledge with capacity to make due use of it; perception of the best ends and the best means; discernment and judgment; discretion; sagacity." It is the "know how." There are two fundamental aspects to wisdom—knowledge and philosophy. Knowledge may be defined as follows: "A result or product of knowing; that which is known. Specifically any fact or truth, or the aggregate of facts, truths and principles, known, acquired or retained by the mind, information respecting phenomena, causes, laws, or principles; learning, scholarship (example: his knowledge is encyclopedic)." It is the "know what." Philosophy may be defined: "Specifically in popular usage general principles, laws or causes that furnish the rational explanation of anything; the rationale by which the facts of any region of knowledge are explained (as the philosophy of a steam engine)." It is the "know why."

#### TEACHING TECHNIQUES

The teacher's concept of his job is determinative of his success. A teacher who does not do research, write or produce intellectual concepts is out of place in higher learning. A mere purveyor of

ideas, the same ideas year after year, might as well make recordings to be played by the janitor. Geography is a poor field for stereotyped teaching. Its content and significance change daily.

Therefore, the opportunity of the teacher of geographer is the development in his students of mental skills and techniques which train them in patterns of interpretation and which also develop abilities to originate new skills and patterns. One of the common mistakes of all teachers is the assumption that merely informing the student means that the student understands and can use the information successfully. How often have we heard a student recite a definition letter perfect, yet fail hopelessly to recognize the situation in actuality. No. Mere memory of information is not education. Even the photographic memory that can recite every word in any line on every page may not know what it is all about. After what I thought was adequate ground work I have given in an examination a list of geographic landscape types indicated by place names which, if properly arranged, resulted in pairs of geographically similar places. Too often, horrible pairs appeared in the answers, because the student attempted to memorize facts and paid no attention to the principles or philosophy involved.

Up-to-date coaches in sports have developed teaching techniques which we may well adopt in methodology. Motion pictures are taken of sports events, football games, track and baseball. After the contest, the coaches study the films, and discuss the performance of individuals in a sports seminar. The individual becomes his own best critic, and he appreciates the meaning of the grade he receives for his performance. If he fails and is benched, he knows why. If he keeps his position, he and his teammates know why too. More specifically, suppose a football coach limited his teaching to merely telling the team how to work a play in skull sessions without any practice field experience or scrimmage body contact. You say ridiculous. I say there are too many teachers who are just as ridiculous in the classroom.

I habitually give monthly tests which I think of as training tests. The class period before the test is devoted to explaining the terminology used in the questions, the principles or philosophy involved in the interpretation of certain specific data or situations, which of course are omitted. After the test, the papers are carefully graded. Then a class period is taken for the analysis

of the test, no individuals named, so that the students not only realize the nature of their performance but that of the rest of the class. In order to save time on occasions, the tests are posted on a bulletin board and the students do the test on their own time.

I adopted this method early in my teaching experience, because I soon learned that most students have the concept that a college course is exposure to a vast volume of facts which are to be forgotten as soon as the final examination is over. They are aided and abetted in the concept by many college teachers who, because of ignorance, laziness, or indifference, stress facts, and grade students on the basis of facts. They give true-false tests, four and five pages long, in which the students generally flip a mental nickel and think they are lucky or unlucky by the grade they get. Other teachers do not train their students in tests and pour it on in one grand final examination, in which the typical student wail is, "I didn't know what he wanted." The general student reaction to memory tests is to copy or to bring a pony. No pony that I ever saw told a student how to make a judgment. No two students originating a judgment will express it exactly the same way.

Another college teaching failure in my opinion is the making up of a list of a hundred or more questions with answers for study purposes for a test or final examination, then the selection of a few from the list for the examination. The teacher's excuse is, "Well, if he knows all the answers to those questions he deserves to pass the course." In such a procedure there is no mental development, just cramming. There may be a little excuse for punch-board examinations in large classes but, admittedly, a high school boy can grade the paper, i.e., evaluate the intelligence of the student, by counting how many times the "X" comes up in the holes on the master sheet.

Another college teaching failure is the posting of long reading assignments to cover information that the teacher wants the student to know but he does not have time to give in the classroom. The usual assumption is that the student, if he reads the assignments, understands what he reads and acquires the wisdom to use it on the proper occasion. In the same category, are term papers, many of which are never read, or the pages are just counted, or even a ruler is used to measure its physical thickness.

It may seem that I am opposed to information, knowledge, data,

facts, figures, reading assignments and term papers. I am not. I am opposed to materials which are undigested by the students. If information alone were the goal of education and mind training, students could be educated more cheaply and more comfortably by giving them an encyclopedia.

In upper class courses and graduate schools, there is no excuse for ignoring the student. The objective of graduate teaching should be the promotion of faculty-student relations. The old swimming-hole method of learning to swim has too many casualties. I doubt whether the individual who swims and does not sink is a superior swimmer to the one who is properly taught. If graduate students are not taught, they do not know how to teach, and merely hand on their own misfortunes. The seminar, field courses, and thesis afford unusually good techniques for graduate teaching if sincerely used. If a graduate learns to think, he will be interested in teaching his students to think. I was fortunate in beginning my graduate study under the teaching of Rollin D. Salisbury who was a bear for accurate facts and an understanding of these facts and the ability of the student to state his understanding of these facts clearly. Geographers who do not like to teach should not be employed to teach geographers. To employ such people is cruel punishment to the students.

#### CONCLUSION

To borrow a business phrase, the teacher should not behave as if he were in a seller's market, where he, the salesman-teacher, in essence says to his customers, the students, here I am, here is what I have, take it or leave it. On the contrary, the teacher should behave as if he were in a buyer's market, where he, the salesman-teacher, studies the needs, characteristics, and requirements of his customers, the students, and where he uses the best techniques and devices to put across what he has. After all, the object of teaching geography is to aid in the education of an individual whether he is to be a general citizen or a geographic specialist. The procedure is just good common sense. To teach effectively requires time and patience.

## A GLOBE-MAP ACTIVITIES PROGRAM\*

JOSEPH E. WILLIAMS

University of Washington

The globe is a precise model of the earth; its diameter and area bear a direct ratio to the diameter and area of the earth. Viewing the globe for the purposes of geography presents special problems in teaching. There is always a visible and an invisible hemisphere, and a slight rotation changes the picture so rapidly that a pupil can hardly remember what he saw last. Also, when forty pupils view a globe, each one sees a different picture. Certain maps can be used that will establish for the pupil a true and realistic concept of the earth; a picture of the globe which either one or forty pupils can study, analyze, and reproduce for themselves. Furthermore, these actual activities of making the globe and then making maps of the globe will establish lasting ideas about global relationships. To accomplish this objective we must first analyze the globe and decide which are the most important hemispheres in terms of land area, productivity, and population. Then we should examine the maps now in use to see how the problems are being handled and attempt to select the projections which best provide the most realistic, truthful, and teachable approach to world geography.

The problem of the cartographer is to attempt to portray something of each of the following five global properties on the map: area, distance, shape, direction, and relative position. No single design map of the whole world or a hemisphere has as yet been devised which can portray all of these properties without the distortion of some. In other words, all world maps and to a lesser degree all hemisphere maps, are a compromise. The purpose for which the map is made governs the cartographer's choice of properties which he will emphasize. Since our purpose is teaching true global relationships thru the activities method, we must first have a projection which the teacher can quickly grasp and convey to her pupils. We can best solve this problem by examining how some major single design and two design maps handle the visible and invisible hemispheres.

\* Presented at the Cleveland Meeting of the National Council of Geography Teachers, November, 1949.

## SINGLE DESIGN WORLD MAPS

We shall consider the Mercator, Sinusoidal, Homolographic, Homolosine, and North Polar Azimuthal Projections.

## MERCATOR PROJECTION

## MERCATOR

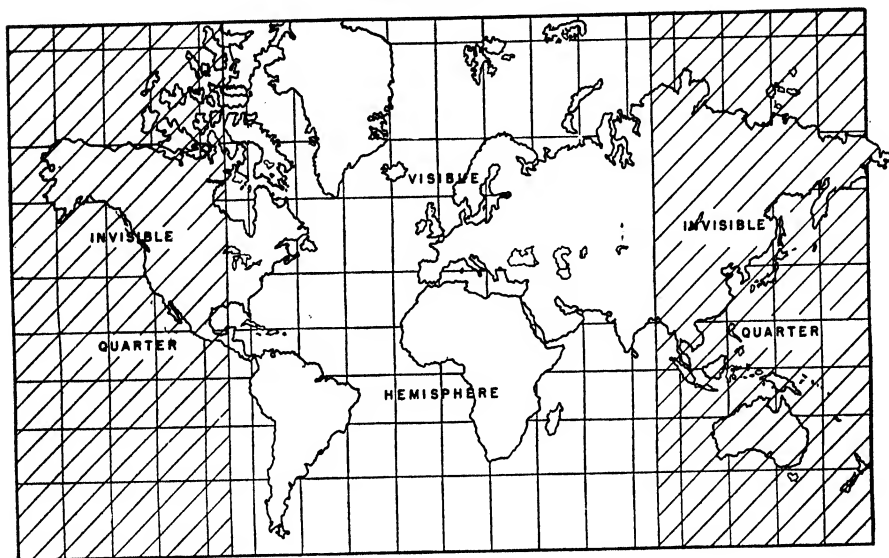


Fig. 1

*Construction*

Gnomonic Cylindrical with modifications to compensate for distorted high latitude areas.

*Qualities*

1. True direction.
2. A navigational chart.
3. Visible hemisphere and invisible quarters are rectangles.
4. Very difficult for the pupil to make the transition from the globe to the map because of the lack of similarity.

*Construction*

A vertical central meridian true to scale.

The parallels and Equator equally spaced on the Central Meridian and drawn to their true length.

## SINUSOIDAL PROJECTION

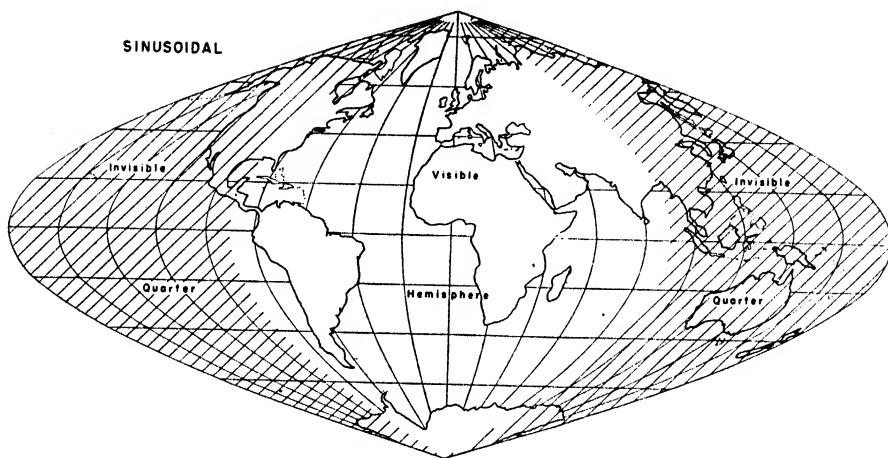


FIG. 2

*Qualities*

Equal area, true E-W distance. Improved resemblance to a globe.

## HOMOLOGRAPHIC PROJECTION

MOLLWEIDE'S HOMOLOGRAPHIC

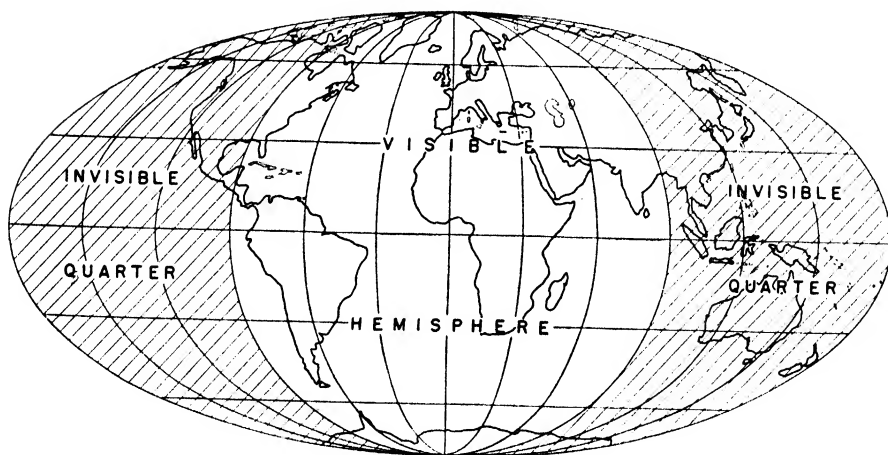


FIG. 3

### *Construction*

The complete circle is made to equal the visible hemisphere. Parallels and meridians are drawn so that the area enclosed by them bears a direct ratio to the same area on the earth. The meridians are ellipses cutting the parallels at equal distance.

### *Qualities*

It is equal area. E-W distances are nearly true to the earth. It is difficult to construct and could not be used in an efficient map activities program in geography.

### GOODE'S HOMOLOGINE PROJECTION

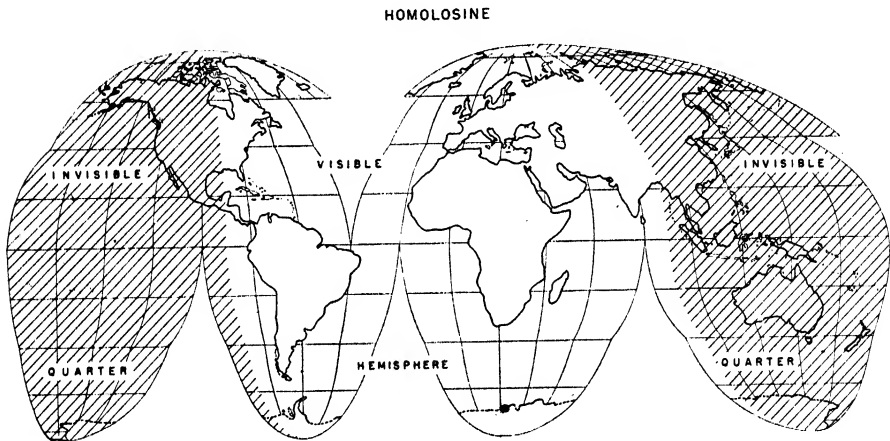


FIG. 4

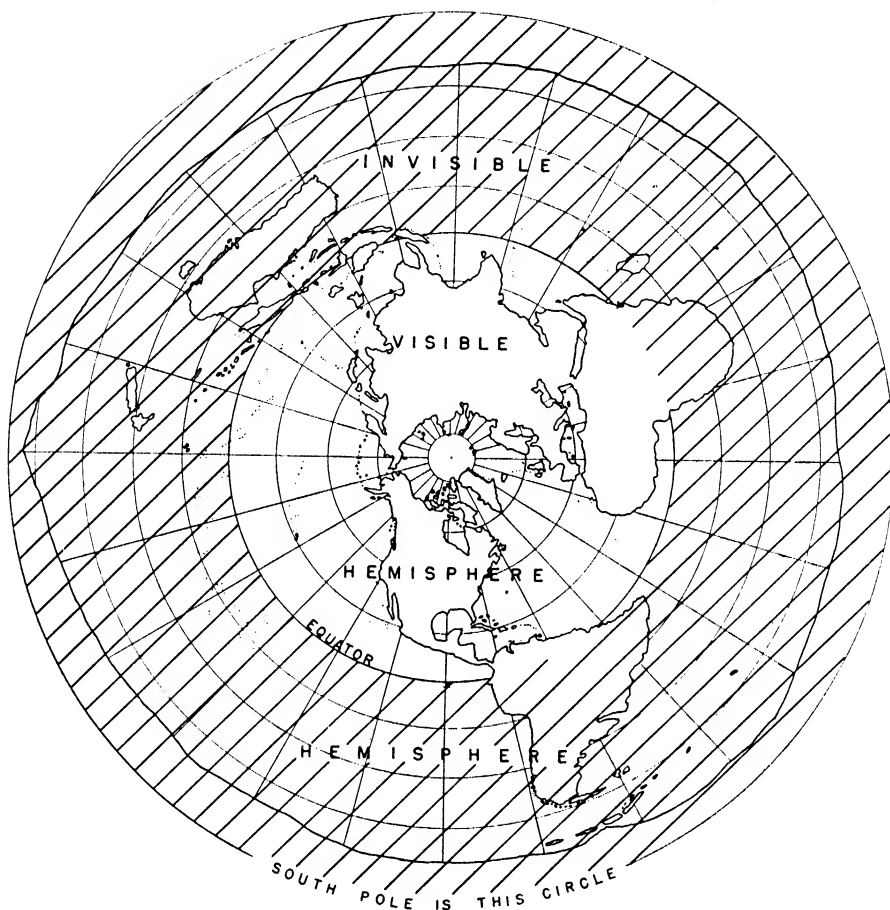
### *Construction*

A combination of the preceding Sinusoidal ( $0^{\circ}$ - $40^{\circ}$  Lat.) and Homolographic ( $40^{\circ}$ - $90^{\circ}$  Lat.) projections; interrupted for true shape.

### *Qualities*

Equal area, true shape for the lands, nearly true E-W distance. Ocean distances are difficult to comprehend. In terms of the entire world, land, and water, it bears little resemblance to the earth. This together with the difficulties of construction rules it out for the beginning activities in geography. This projection is excellent for advanced work in the comparative geography of the continents.

## NORTH POLAR (AZIMUTHAL EQUIDISTANT)



POLAR AZIMUTHAL EQUIDISTANT

FIG. 5

*Construction*

The visible hemisphere is the Northern Hemisphere and the starting point is the North Pole. Parallels are concentric circles equally spaced around the North Pole. Meridians are straight lines at their true Azimuth or angle around the North Pole. They can be laid out with a protractor.

*Qualities*

The all important Northern Hemisphere is kept intact. If the projection is stopped at  $60^\circ$  South Latitude, then all of the habitable

world is on a single map. The relative position of North America, Europe, and Asia is well preserved. The North Pole is a point and the Equator a circle. When this map is held beside the globe with the viewpoint centered on the North Pole, the map and globe possess similarities. It is simple to construct and may fit into a world map activities program easily except for one difficult feature—a badly distorted Southern Hemisphere.

### HEMISPHERE OR TWO DESIGN WORLD MAPS

From the preceding discussion it is evident that the single design world maps are very difficult to use in an activities program to teach accurate global geography; either the projections are too difficult to construct or the resulting map bears little resemblance to the globe. If we could concentrate on first one hemisphere, then its opposite, at least the problem of the invisible hemisphere would be solved.

The next logical step seems to be to analyze the globe in terms of the most important hemispheres and their opposites or antipodal hemispheres. This results in three pairs of hemispheres that are of considerable value in understanding the relationships between the oceans and continents:

1. Northern and Southern Hemispheres.
2. Eastern and Western Hemispheres.
3. Land and Water Hemispheres.

Any two of these hemispheres are identical in shape and area. Therefore, the maps of each hemisphere should have identical shapes and bear a direct resemblance to the globe so that a pupil can see that the map is depicting the truth about the globe. Of the three pairs of hemispheres, the Northern and Southern is by far the easiest to use in the map activities program. Our next problem is to choose the best projection from those commonly used to depict these hemispheres, namely: orthographic, stereographic, azimuthal equal area, and azimuthal equidistant projections. Even the orthographic and stereographic projections of hemispheres are frequently used in present day maps or atlases,<sup>1</sup> they have very little to offer in map exercises for the beginning pupil. They are more difficult to construct and the resulting shapes of the continents and oceans are not more accurate than the easily constructed azimuthal equal area and equidistant projections.

<sup>1</sup> Raisz, Erwin, *General Cartography*, McGraw-Hill, pp. 82-84, 1948.

## HEMISPHERE POLAR AZIMUTHAL EQUAL AREA



FIG. 6

*Construction*

With the pole as the center the parallels are concentric circles drawn with radii equal to the chord of the meridian from the parallel to the pole. Meridians are laid out with protractor as straight lines from the pole.

*Qualities*

Equal area. Similar to the globe. Distances between North America and Asia fairly well preserved. Not quite as easily constructed as the Polar Equidistant Projection.

# HEMISPHERE POLAR AZIMUTHAL EQUIDISTANT



FIG. 7

## Construction

With the pole as point at the center draw the parallels as equally spaced concentric circles. With a protractor lay out the meridians as straight lines from the center.

## Qualities

Preserves the unity of the Northern Hemisphere. Distances between North America and Eurasia nearly true to scale. Global position well preserved. Bears a similarity to the globe and is easily constructed. Excellent for a map activities program.

The best projection to use to depict the Northern and Southern

Hemispheres is the Polar Azimuthal which may be either equal area or equidistant. The equidistant projection is so easy to construct that it outweighs the equal area and the end result is so similar that the choice is overwhelmingly in favor of the equidistant. One Polar Equidistant design for the Northern Hemisphere, and another similar design beside it for the Southern Hemisphere helps the pupil to make an accurate transition from the globe to the map.

#### USES OF AZIMUTHAL EQUIDISTANT MAPS

We have reviewed some of the major maps or projections and have pointed out the advantages of the Two Design Polar Azimuthal maps. The next step is to decide the uses to which these maps can be put in a map-globe activities program.

One approach to world geography is to first put into the pupils' hands the necessary tools and materials to make global hemispheres and finally assemble these into a globe. Inexpensive paper hemispheres are first assembled with scotch tape so they can be studied separately and flattened by opening the gores or lunes, first at the poles, then re-assembled and opened at the Equator. This reveals to the pupil the basic approach to the two types of maps, the single design world and the two design world. When the pupil takes the gores apart and rearranges them to fit the pattern of the grid of parallels and meridians, he is given an opportunity to learn latitude, longitude, and much about the arrangement of the continents and oceans. After carefully studying the hemispheres, it is easy to assemble them into a globe.

The pupil now progresses to the problem of making a map of the globe which he has just assembled. At this time, he is given the simple instructions for constructing the Polar Azimuthal Equidistant Projection or circular grid as described above. After the grid of parallels and meridians is drawn, the pupil transfers the coast lines of the continents from the globe to the map, section by section. In this activity the pupil learns the size, shape, and relative position of the geographical features. His finished map bears a direct resemblance to the globe; if the two are held side by side he is convinced that he has mastered a new technique.

The pupil may now compare his maps with printed global maps. He finds that he has done a comparable job. He may progress to the more advanced tasks of geography by studying and working with printed outline maps because he knows how they were made and

what they represent. The data of the new maps should be approached in a systematic manner with the physical landscape first so that separate lessons proceed with these topics:

1. Continents and Islands
2. Oceans, Seas, Gulfs and Bays
3. The Atmosphere
4. Rivers, Lakes, and Inland Seas
5. Land Features
6. Climate
7. Vegetation

It is possible to make transparent hemispheres, a little larger than the paper globe, which represent the atmosphere and the planetary winds. These can be assembled on the globe to show the air and its currents around the earth.

After the physical features are studied the pupil can begin the cultural features with a systematic approach thru the following topics:

1. Population
2. Countries
3. Farming and Stock Raising
4. Power to Run Machines
5. Iron and Steel Production
6. Industrial Cities and Factory Areas
7. Ocean Trade and Ports
8. Global Airways

In this way world resources may be compared to the distribution of population, and the spread of the various national areas encompassing these resources. Now, the pupil should have sufficient data with which to develop power concepts with regard to the whole earth and its dependent population. The tasks of world geography have been broken down so that any pupil may grasp them and finally fit them into the complex puzzle of world relationships. It is thru the correct interpretation of earth facts and the analyzing of their place in the needs, wants, and desires of peoples, that geography becomes a useful tool in the educational program.

## THE SAMPLE STUDY—A METHOD AND ITS LIMITATIONS

GLADYS M. HICKMAN

University of Bristol, Bristol, England

Geographers have long been aware that their teaching has a long-term contribution that is much more important to the future citizen than the acquisition of facts about the world and its occupants. Geography forms "... part of the mental equipment necessary for the intelligent reading of the newspaper, for grasping the significance of current affairs, for some understanding of the complex world in which we live."\*

Our problem has not only been the choice of material from an impossibly wide (a world-wide) field, but also how to make our teaching of those areas of the "homeland" that are unknown to our pupils, realistic, interesting and profitable.

We have in the past tended to approach this problem of studying the whole world by a selection of those parts which seemed more important to us, and by dangerous generalization about large sections of the earth's surface. Nevertheless it is a problem that must be faced and solved, because it is in the sphere of global thinking and sympathetic understanding that geography makes one of its strongest contributions.

An alternative method which is being used by a number of people, is that of the "Sample Study." In order to assess the value of this technique we need to know what a Sample Study is, the advantages of such a method, the various parts of the geographic field to which this method can be applied, and lastly, its weaknesses. The real testing of the method—its trial with parallel groups, one taught by this, and another by formal methods, presents another problem, for its success is very closely related to the particular knowledge and personality of the teacher, and his ability to "put across" and "follow up."

Such a study, whether it is called a sample, a "type" study, a "patch" or any other name, will usually have five sections:

1. The simple response to the physical environment, in the way of life of a village or other unit of settlement; considerable detail on lay-out of settlement, plan of home, food, clothes, furniture, customs and general mode of living, seasonal work, etc. as they relate to vegetation, climate and position. (Maps and pictures essential.)

\* H.M.S.O. Report.

2. Generalization from this where it is possible; the world distribution of related types; how they do in fact differ from one another because of differences in position and the extent to which they have been developed, and why (map).
3. An important section on the modern utilization of such regions, including the kind of current material every geography teacher uses to bring textbooks up to date, and to introduce a sense of "immediacy" or "in-the-news-ness" into the lesson.
4. References—sources of information and material that will enrich the knowledge of the teacher and give reality to the material when used in school.
5. Pictures.

The remainder of this paper therefore includes the following sections:

1. An example of a "Sample Study" and its application, presented as briefly as possible.
2. The advantages and disadvantages of the method.
3. The problem of source material.

### THE LAPP COMMUNITIES OF THE SCANDINAVIAN SUB-ARCTIC

Part of northern Scandinavia is inhabited by groups of Lapps who formerly gained a living mainly from herding reindeer and from fishing. The need to provide

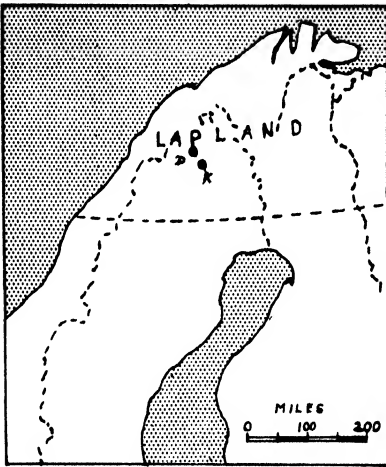


FIG. 1. Locational sketch map

enough pasture in this area of meagre vegetation has resulted in transhumance, the seasonal movement into the Norwegian mountain pastures in summer as the snow clears, and a return to the lowland settlement as the ground takes on the snow cover of winter, in rhythm with the seasonal changes thruout the year. Hence the summer tent of poles, formerly covered with skin and now with coarse cloth (like sack-ing) is easily moved, while the "per-manent" or winter home (Kâtân) is

made from turf and stone—a sod hut. This formerly had an earthen floor covered with brushwood, a window, stove and various items of furniture, and the softest reindeer pelts as bedding. Food, clothing, fuel and most of the gear would be produced by the locality, from the reindeer herds themselves, from rivers and lakes, and from the stunted birch vegetation. Problems were the winter dark or twilight period and that of feeding the reindeer unless the snow cover is so thin that they can nose out the moss for themselves.

These characteristics can be well illustrated from one or two settlements. At Djupviken, situated on the shore of a lake (Vikharkow), where there are five families, sod huts and summer "nomadic" tents are still used, but the kâtân is wood panelled inside, the floor is raised and properly joisted and is insulated underneath with dried grass and small birch twigs. Walls, floor and ceiling are polished or stained a rich brown. Contents include an iron stove (with chimney), wooden tables, chairs, "dresser," beds or couches which could push under each other, Tilly lamp (primus type) for light, Singer sewing machine, iron and aluminum pots and pans, china and cutlery, rugs, curtains, clothes pegs on a line, pictures and so on. It was a small but normal and comfortable home, with walls so thick that it should be very warm. Fishing nets were hanging out on posts to dry, and a small boat with an out-board engine was beached below on the shore. Illustrative of the contrasts due to a continuance of the old and the infiltration of new ways, a bear trap hung on a fence, yet the son of one rather bent old Lapp was working with a film unit in Stockholm. Two of the families lived in modern sawn timber homes. The settlement also grew a small quantity of potatoes and carrots and kept goats and young calves.

Another group of settlements illustrated still greater change, tho again the Lapp costume was worn, probably because it was functional, and there were kâtân and tents on the site. Here in this

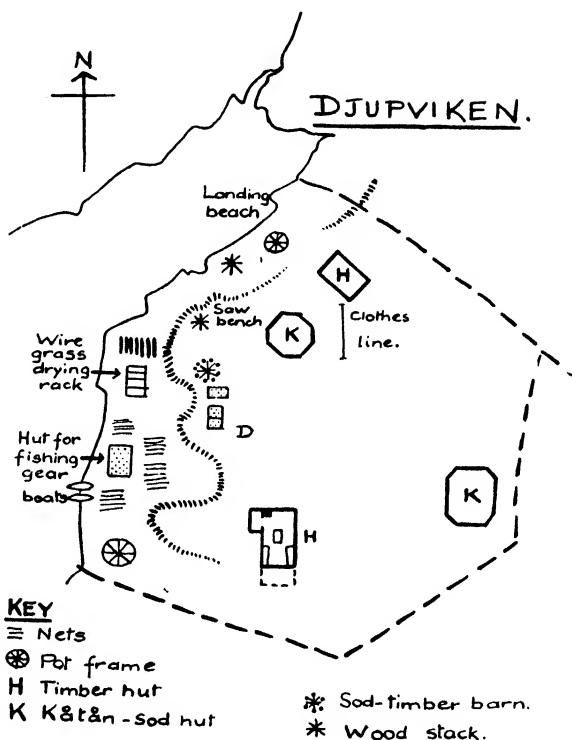


FIG. 2. Sketch map of Djupviken



FIG. 3. Djupviken. The new Kâtân (sod house)

very isolated place, electricity was available by wind driven dynamo. There was telephone connection to the nearest "village" about twelve miles away, and the family, from one very comfortably furnished wooden house (with bedrooms upstairs), went weekly along the lake to fetch rations from a store, a journey of eight hours in all. Their cash income was quite good, because there was a return of about 25 per cent per annum on their herd, which was valued at about £1,500 at that time. A group of settlements nearby shared a school attended by seven children, from seven to eleven years of age, after which they went to the state boarding school in Kiruna. Everyone spoke Lapp, but the children learned Swedish when they went to school, and there education was, after that, bi-lingual.

These changes in a traditional way of life were, briefly, due to two main things; the existence of a great iron ore body at Kiruna, 40 miles to the east and the development of the technical skill which could mine and transport it; and the climatic situation in the north Baltic where the sea is frozen for five months, while to the

west, the port of Narvik remains open all the year round. It was this closing of the Baltic route that stimulated the construction of the route to Narvik, thru a region that is now accessible even tho it has no roads. Engineering skill and the ability to provide abundant cheap hydro-electric power make it possible for this route to stay open all the year. Nevertheless it is still necessary to overcome the disabilities of this sub-arctic region. The winter twilight is lit by flood-lighting in iron ore quarries and streets, milk and cream and other food (including bananas) are brought in by rail, so that Kiruna, tho only 15,000 in population, is a spacious, clean, almost luxurious small town nearly 100 miles within the Arctic.

The use of this core study would be in the development of an understanding of the physical setting in the Arctic and sub-Arctic by an indirect approach; these would include the increasing length of winter night and summer day, to the point where the sun makes the complete circuit of the sky, always in view but in the south at noon, the north at midnight and so on (northern hemisphere); the cumulative effect of the long hours of summer daylight on the ripening of crops; the character of the vegetation; the more extreme conditions of the "Eskimo" Arctic, where, however, the permanent dwelling may still be a sod hut.

The modern development of such areas as the Soviet Arctic or Alaska, will illustrate the essentially dynamic quality of geography and how it is so often man who gives the earth its characteristic expression. For it is man who has become the main factor determining environmental change. Again there will be the flood lighting of the winter dark; the problems of permanently frozen sub-soil and of food and home; it will indicate how man has used the high

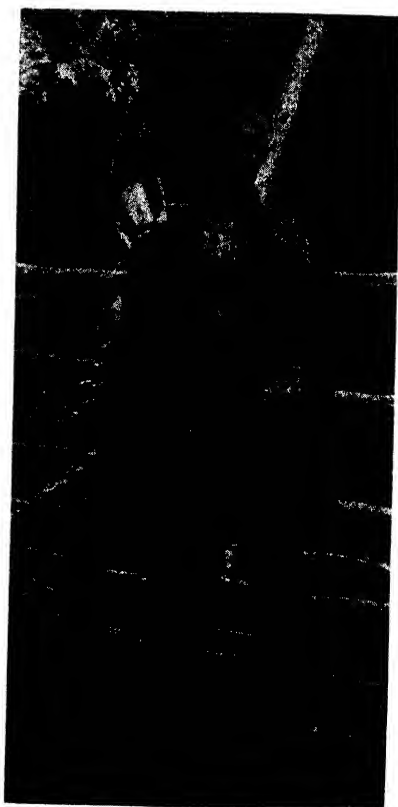


FIG. 4. An old Lapp at Djupviken



FIG. 5. Laimoviken. Old and new—lake boats and homesteads. Notice the wind driven dynamo between the timber houses.

winds of the Arctic to give light and grow crops, and the fundamentally important factor of strategy where the shortest route between so many northern hemisphere towns is by trans-polar flight.

For what kind of work in geography might this method be used? Essentially for studies where there is the need to extend to a larger region, and particularly for the four following groups:

*1. Major Natural Regions (Natural Geographic Regions).*

The method here would be to take the twelve most important regions, such as Equatorial, Monsoon, Desert, Mediterranean, etc. and for each to develop a core study in simple response, the modern development of the region, the general aspects of the regional type in other parts of the world and dissimilarities where they exist.

*2. Commodity Studies.*

The study of the farm plantation of a very important area of production; all the facets of growing and marketing the crop; the world distribution and necessary qualification of what has gone before. Possible for most economic products.

*3. Samples of the Way of Life in Fairly Small Regions.*

This method could be used for the contrasted study of an area with numerous sub-regions eg., the British Isles.

For example, the crofting township and how far it can illustrate the quality of life

in Highland Scotland; other farming and regional studies; the functions of towns, such as fishing ports, coal mining towns, market towns, a characteristic village, multifunctional towns and great ports.

#### 4. For the More Effective Study of a Country.

If time is very limited it is sometimes better to introduce the atmosphere of a country thru this method rather than to take one or two lessons of formal approach, e.g., for Switzerland, Holland, Denmark, Egypt, even India.

There are so many possible ways of teaching any given topic that it must be made quite plain that this is only a method, and that it should by

no means become *the* method. It does however appear to have certain advantages provided that it is used with discrimination, and these may be summarized as follows:

1. It is often the small everyday things that appeal to children and are remembered by them.
2. It is often possible to develop an understanding of relationships by natural association instead of by a more academic approach so that items of relief, climate, vegetation, and so on, still take their right place but in a more realistic manner.
3. It has an ability to illustrate change, the old continuing alongside the new—a very useful corrective for textbooks so soon out of date.
4. In this connection it can be used in conjunction *with* the textbook, for the textbook will rarely contain the full detail of a Sample Study, and each will be a useful supplement to the other.
5. It can be adapted to suit a variety of ages by a judicious selection of material. A high standard of factual knowledge seems to be acceptable to children in this form, for it hangs together in an "almost living experience." On the other hand it can give some understanding of what is, without necessarily going into explanations that may rightly come at another stage when such work is taken with junior children.

Items that cannot be illustrated at one point may well be explained at another, e.g., the permanently frozen sub-soil is illustrated by subsiding houses under modern development of the Soviet Arctic.

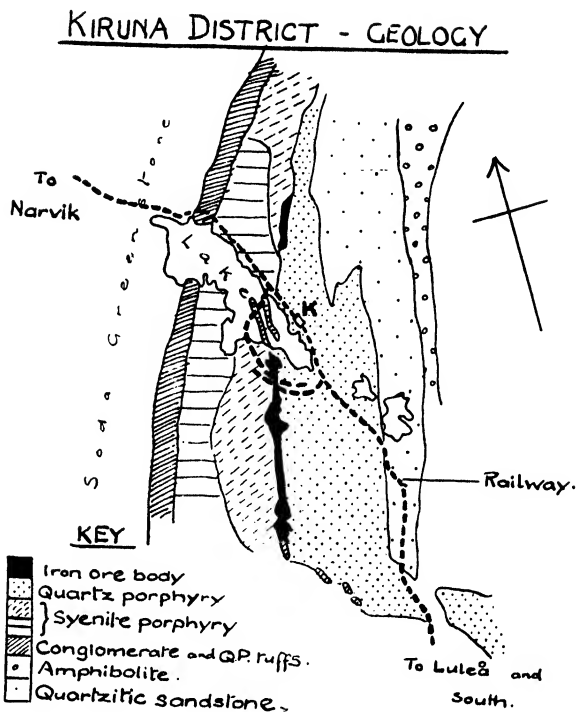


FIG. 6. Kiruna mining district

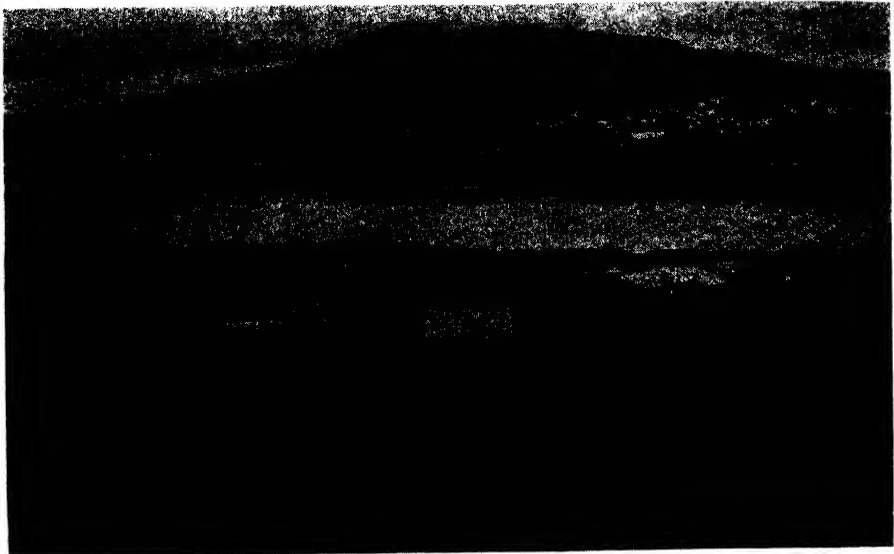


FIG. 7. Kiruna. The view of Kiruna from the southern "iron ridge" looking across the lake northwards.

6. It can give a vivid presentation of urgent problems, and sow the seed of understanding; it can illustrate the evils of robbing the earth and the need for conservation.

### The disadvantages may be summarized as follows:

1. Unless taken in adequate detail it can be elementary and superficial.
2. If this method is used all the time the children will be as bored as by any other method that is almost constantly in use.
3. Generalization is not always possible or desirable. Altho there is some similarity between regions one must not ignore the fundamental character that may be attributed to each, whatever its cause. Sometimes it is more useful to state contrasts and to say "Altho this is true for this area, in . . . the situation is rather different." Vogt says in *The Road to Survival* (p. 55) "All phenomena from individual cornfields to individual countries are *unique* and (as processes) *constantly changing*."
4. The method is of little use unless it is supported by adequate visual material in the form of pictures and diagrams, for verbal imagery is dependent on the personality of the teacher and can be more certain of being effective if accompanied by these aids.
5. Often the required material is inaccessible or is quite unknown to the teacher.

It is this that brings me to the final problem, for tho many ex-service men have travelled widely, most teachers have little experience of other parts of the world. If they have, they know the difference between teaching the known area and the unknown. We are dependent on second hand material, and there is as yet no uniform source of such information. Sometimes the material comes from the last likely sources, such as "At Home in India" which came from a popular women's magazine. Geographical magazines,

picture post cards, travel stories of all kinds, monographs of anthropological institutes, and so on, provide much varied material.

Perhaps it is only possible to make this information available to teachers if geographers who have such knowledge will cooperate, and write it up for educational journals. If the method proves successful and a need for such studies is expressed, there is far greater likelihood that some of our writers of educational textbooks will produce something, either out of their own experience or by gathering into one volume a series of such studies.

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## A GEOGRAPHY ASSIGNMENT AND SOME OF THE RESULTS

CLARE SYMONDS

Quincy, Illinois  
Senior High School

Too few high school pupils have any skill in finding or in selecting relevant information on assigned topics. Nor do they possess the skill to organize such information. They need a great deal of practice and helpful guidance and plenty of reference material with which to work. It may be that even more important are topics of interest to that age group.

Geography is an ideal course in which to teach such skills because of the wealth of information and the wide diversity of topics. Travel—seeing other places, meeting other people, and perhaps most fascinating, the various methods of travel—even tho vicarious—will usually hold the interest of this age group for long periods of time.

The following is one of several assignments given during the year in which specific information is called for but a wide latitude allowed for individual differences.

### THE ASSIGNMENT

*Prepare a report on the following topic:*

A three-week trip from Quincy with visits (at least one day) in the capitals of ten Latin American countries. (All countries south of the United States are so-called.—*World Geography* by Bradley—page 404.)

### *Suggestions:*

1. Use note cards in recording facts to be incorporated into your report.
2. Make a complete list of references in which you find usable information.

3. Keep in mind that the report is to be read to the class and then handed in. (The class will be especially interested in hearing some details of your trip as well descriptions of the things you see and of your activities.)

#### SUGGESTED SOURCES OF INFORMATION

##### *Books*

1. *Information Please Almanac 1947*<sup>1</sup>
2. *The Story of Nations* by Rogers, Adams, and Brown (1940)
3. *Our Latin American Neighbors* by Brown, Bailey, and Haring (1944)

##### *Magazine Articles*

1. *Reader's Digest*, January 1949 "Now You Can Take That Trip Abroad" by Julian Trippe
2. *World Week* (see files)

##### *Booklets from Pan American Union*

1. The "Capital Series"
2. The "Travel Series"  
(Mexico, Brazil, Colombia, El Salvador, Honduras, Nicaragua, Venezuela.)
3. The Pan American Highway
4. The Americas—A Panoramic View
5. Seeing the Latin Republics of North America.
6. Requirements for the entry of United States citizens into the Latin American Republics. (Rev. 1948)

After each pupil had read the assignment, it was discussed briefly and methods of procedure and a suggestive time-table of activities outlined. (These were written on the blackboard as the suggestions were made and revised. Later mimeographed copies were made for each pupil.)

1. Read carefully and discuss among classmates the general information on page 628 in "Suggested reference book No. 1." Also read the magazine article given specifically in the reference list. (Some pupils offered to report on this article in each class.) (2 days)
2. Class discussion of the above general information. (1 day)
3. Study the air and other globes and the wall maps to determine a possible itinerary.
4. Read travel information (especially entry requirements) for the countries on the selected itinerary. (3 days for 3, 4)
5. Class discussion of problems—using wall maps to point up discussion. (1 day)
6. Make a list of cities to be visited and for each write the entry requirements.
7. Write a report<sup>2</sup> of the preliminary arrangements for the trip, using information in No. 1 and No. 6. (2 days for 6 and 7)
8. On a desk map locate the cities to be visited and draw route of travel with necessary stopovers.
9. Figure time required and route according to the means of travel selected. (2 days for 8 and 9)

<sup>1</sup> Thirty copies in classroom library.

<sup>2</sup> At the suggestion of many pupils an outline for this was worked out in class and placed on the blackboard as a guide for those who needed such help.

10. Write, for each city visited, a description of things seen and done during the one day (or more) of your visit. (Use your own words and remember to use good judgment in selecting things to do and to see in the time available in each city.)<sup>3</sup> (1 week)

The project occupied about four weeks of class time with a few minutes of general discussion almost every day and a great deal of consultation with the teacher and among themselves during the whole four weeks. Many of the pupils did a great deal of work outside of class time.

A few days after the project was begun, the pupils were thrilled to find an article and a map in a Chicago Sunday paper concerning a similar trip to Latin America. Many of them planned their trips from this article.

Another current happening which fitted into the project was a news article and a radio report of a local lawyer's airplane trip to Mexico and a couple of Central American countries.

The report chosen to represent the results of this project is one of those voted "most interesting" by the classes which heard them read. The author of this one was a senior<sup>4</sup> but some of the sophomores' reports were equally well received by their classmates.

## MY TRIP TO LATIN AMERICA

JIM SNIDER  
Quincy, Illinois

Most of the details of my three-week vacation trip to Latin America were already worked out when I applied at the Federal District Court in the Post Office Building for a passport to visit Honduras, Costa Rica, El Salvador, Nicaragua, Colombia, and Venezuela. I supplied the necessary two photographs and paid the \$10.00 fee.

Since it was necessary to make a personal application for visas and tourist cards, I went to Chicago where each country on my tour maintains a consulate. There I applied for visas for Costa Rica, El Salvador, Honduras, Nicaragua, Colombia, and Venezuela; and for tourist cards to visit Cuba, Panama, Guatemala, and Mexico. Upon my return home I cabled the State Department of Colombia for permission to visit in that country and received a favorable reply. I was certainly glad I had started my preparation early, since it took nearly six weeks to get my visas.

It was necessary to secure a police certificate as tourists in Colombia, Costa Rica, Nicaragua, and Venezuela are required to show such a certificate.

<sup>3</sup> This note was added to the suggestions worked out by pupils as a reminder that they must be *thoughtful* in planning their visits.

<sup>4</sup> The classes are made up of all three senior high grades with a preponderance of sophomores because this course in World Geography is one of the elective courses which may be chosen to make up the social studies required for graduation. Geography usually outranks World History in the number of classes but occasionally the number of students who elect these courses is approximately the same in each.

The Mayor of our city provided me with a letter of recommendation required by Colombia.

My doctor gave me a health certificate and a certificate showing that I had been successfully vaccinated recently—both of which were required by some of the countries I visited.

One of the important preliminary arrangements was having a photostatic copy made of my birth certificate because it is one of the best proofs of United States citizenship.

I had my expense money changed into American Express Traveler's Checks for security reasons. Naturally, I found it necessary to exchange some of these for the local currency in most of the countries I visited. United States Currency was freely accepted in Cuba and El Salvador.

The Pan American Airways helped me to plan my trip and secured my tickets and hotel reservations in Havana, Mexico City, Caracas, Guatemala City, Bogotá, Panama City, San Jose, San Salvador, Managua, and Tegucigalpa.

Early on the morning of March 1, I left for Miami in my convertible. I drove to St. Louis, and from there, south to Memphis, Tennessee, arriving there about nine that night. I stayed in Memphis that night and got an early start the next morning. I reached Birmingham at noon, and after lunch I started the 400 mile drive to Jacksonville, Florida. I arrived at one o'clock on the morning of March 3, slept till noon, and drove 350 miles along the coast to Miami. By eight that night I was at the home of a friend in Miami, talking about my trip.

I had brought only the simplest of clothes: overall pants, "T" shirts, heavy shoes, a rain outfit for the tropical downpours I expected, one good medium weight suit, and a hat—an item necessary to prevent sunstroke. All in all, I had just the bare essentials, and my baggage was well within the P.A.A. limit.

My friend allowed me to store my car in his garage during most of my trip. After a good night's rest, I boarded a P.A.A. plane for Mexico City at noon on March 5.

Five and a half hours later I was in Mexico's capital. I had my credentials checked, (I always kept my credentials ready so they might be checked at any time) and went to the Carlton Hotel. At the hotel I had my first taste of real Mexican food. The next morning I arose early and proceeded to take a look at the town. I found Mexico City to be a modern city with a million and a half people. It is very beautiful, having many parks which are filled with flowers. That afternoon, I rode down the Cinco de Maya, the principal street in the business district. That evening, in one of Mexico City's many modern movie houses, I saw one of the latest Hollywood releases—in Spanish. The next day, I went on a sight-seeing trip to the Pyramid of the Sun, twenty-five miles from Mexico City. The various ruins occupy eleven acres, and the Pyramid itself is 210 feet high. The ancient buildings, most of which were temples, are over 3,000 years old. On the way back to the Capital, we stopped at a small village where a local festival was being held. I purchased several pieces of jewelry—hand fashioned from turquoise and silver. The festival itself was loads of fun, and consisted of dancing, singing, fireworks, and a bullfight—the first I had ever seen.

That night in Mexico City, I talked with an American Official about my visit to Guatemala, and he served as a guide in showing me other interesting sights of Mexico City, among which was the Cathedral, built in 1667.

On Tuesday, March 8, I flew to Guatemala City, capital of Guatemala. The trip required two and one-half hours, and the air view of the city was very beautiful. The city is surrounded by mountains, many of which were once volcanoes. I learned that there are still two active volcanoes in the country. I remained in the city for two days and explored much of it. All the streets in Guatemala City are laid out north-south

and east-west. The new parts of the town have modern wide streets, but the older parts have very narrow streets. The "La Reforma" is a very wide street, and is three miles long. The older buildings are seldom over two stories high because of earthquakes, but newer ones are taller, since they are built stronger.

Among the sights which I saw during my visit were the Palace of the Archbishop, the Cathedral, some beautiful government buildings, two museums, and several fine private clubs. I visited the Central Market, but bought nothing because the gift shops in the lobby of my hotel, the Palace, took care of my gift needs. My last day in the country I drove out to the capital of Ancient Central America, Antigua, where 15,000 people still live in the ruins of this ancient and interesting city.

One hour's flying time the next day, took me to San Salvador, the capital of El Salvador. After my credentials were checked at the airport, I went to my hotel, the Astoria. The city lies in a pleasant valley, surrounded by hills. The Plaza Bolivar in the heart of the city is a meeting place for everyone. There are band concerts in this plaza, on various occasions. I visited the National Palace, and the very beautiful cathedral. Most of the houses are of Spanish style. Many buses and cars may be seen on the modern streets at any hour, day or night.

The next day, I toured the town, and saw many beautiful private residences, the military school, and the market. Strange as it may seem, Sunday is the biggest market day. The last afternoon in San Salvador was spent in a visit, to the beautiful country club, to which I had been invited by an American member.

March 15, I reached Tegucigalpa, capital of Honduras, the trip requiring an hour. I went to the Hotel Ritz, and sent several cards and letters home. The next day I toured the city, visiting the mint, post office, the modern airport, and the statue of the national hero, Morazan. On the next day, I toured Honduras' industries, and saw how the country's bananas, coffee, mahogany, and minerals are made ready for use.

I got a good night's rest, and flew to Managua, forty-five minutes by P.A.A. After my papers had been checked, I went to the hotel, Lido Palace. During my two days in the city, I visited a liquor factory, a cosmetic house, the Presidential Palace, and the exclusive Managua Social Club. I found no specialty store in Managua, since Nicaragua's wholesale trade has never been developed. I saw a motion picture at the "Teatro Gonzale"—the finest movie house in Central America. An interesting highlight to my visit here was seeing the city's ultramodern fire department. The reason for this interest in the fire departments lies in the fact that Managua used to have so many fires due to earthquakes that the city is very fire-conscious. This department is the pride and joy of the city.

March 18, I left Managua, and an hour later I was in San Jose, Costa Rica's beautiful capital. The residences are especially nice, I learned, when, after leaving my baggage at the Rex Hotel, I began to visit the city. The streets are well-paved, and are laid out in checkerboard order. Most of the buildings are low, under four stories. While in the city, I visited a bakery, the National Museum, and the La Sabana recreation park which is west of the city.

Sunday, March 20, I landed at Panama City after a flight of one hour and forty-five minutes. I stayed at the government-owned Tivoli Hotel, one mile from the city proper. During my visit, I saw horse and dog racing, a coffee plantation, the coconut industry, and the pearl divers at work in the gulf of Panama. The city itself was good enough, but I had little time for it, since I was soon on my way to Bogotá, Colombia, two air-hours away.

I arrived there on Monday, March 21, and had my credentials checked. Since time was beginning to be precious, I stayed there only twenty-four hours, my headquarters being the Hotel Aster. However, I did make my stay worth while, as I saw

most of the sights, including the Plaza Bolivar with its statue of Bolivar, the white granite capitol building, the library, Presidential Palace, and the schools. The city is in a healthful region, 8,564 feet above sea level, and surrounded by mountains.

Tuesday the 22nd, I flew to Caracas, Venezuela in two hours forty-five minutes. (All the flights so far had provided an interesting method of studying Central America's geography—from the plane window.) I registered at the Melrose hotel, and had lunch. The food on my plate was good on the whole, most of it being American style. That afternoon, I visited a chicle plant, and toured the city, finding it to be one of well-planned streets, and well-kept parks. The city is a contrast of old and new, both in appearance, and customs. I visited Maracaibo, the capital of the country's oil industry, and then boarded a plane to Miami, six hours away.

I arrived at my friend's house that evening, and rested there that night. The next day, bright and early, we put my light blue convertible on the Key West Ferry, and went to Cuba. We stayed at the La Union Hotel, but for the most part we were on the go, since in two days' time we went to races, cockfights, drove forty miles across the island's wonderful road to visit Bataband, and toured Havana, seeing the many mansions and private clubs, the markets and beautiful Malecon Drive.

We visited Morro Castle, the fortress which guards Havana harbor, and were very much impressed by it just as we were impressed with all of Havana. The Prado is the main street of Havana, and is a beautiful street of fine buildings and shaded parkways. The capitol building looks very much like ours at Washington, except for its gold dome. This modern part of Cuba's capital city and chief shipping port is like an American city, but we also visited the old section nearby where houses built flush with the sidewalks line the narrow streets. The grilled windows typify the old Spanish influence.

Once back in Miami, I rested up for the last leg of my trip, the drive back to Quincy. I had run a week over my allotted time, but it was well worth the time and money. I was back in Quincy March 28, with my car full of assorted souvenirs. Already I am looking forward to another such trip, but that one is to be on the Pan-American Highway when and if it is finished.

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## THE RELATION OF GEOGRAPHY TO OTHER SOCIAL STUDIES AND PHYSICAL SCIENCES IN THE CLEVELAND SCHOOLS\*

CLYDE F. VARNER  
Cleveland, Ohio

Geography in the Cleveland Public Schools is neither an orphan nor a spoiled child. It is just a member of the family. It does not always get as large a piece of the curriculum pie as it would like, and that fact brings it into sympathetic accord with the other members of the family who suffer from a similar deprivation. The pie is quite large, but the family is large and constantly growing. Each member is certain that all the others are well nourished.

\* Presented at the Cleveland meeting of the National Council of Geography Teachers, November, 1949.

Probably many Cleveland teachers regret that they did not take at least one more course in geography, but few have permitted its importance to escape them. They all know that geography should be a more pleasant study than that of history, for the Creator was responsible for geography and made man responsible for the history. The chief difference seems to be that man cannot look upon his work and call it good.

These teachers are quite aware of geography's influence upon man. They know that if the climate, rainfall, and soil of the Garden of Eden had not been conducive to orchard planting man might not have been driven out. That was the only total transmigration in history, and geography was responsible for it. We should stop blaming Eve; it was geography's fault. I know that an eminent modern geographer says that this transmigration was due solely to the absence of rainfall, but there has long been a rumor circulated to the effect that it was due to the presence of another kind of fall!

But now from the Garden of Eden to "the best location in the nation" and its schools, Cleveland. It is probably not too early to reveal that I was asked to report on "The Relation of Geography to Other Social Studies and Physical Sciences in the Cleveland Schools." I iterate that my role is that of a reporter. I am neither a specialist in geography nor a salesman for the Cleveland schools. I wish only to show my guests a few pictures from our bulky curriculum album, and I shall call your attention to but three: geography, other social studies, and physical science. In every case these pictures are copies of the originals found in the courses of study prepared by teachers in these fields. They are not sketches of what should be done, but of what is being attempted at the present.

#### PHYSICAL SCIENCES

We shall look first at the physical sciences. In Grade Six, two units have not only a relationship *to* geography, but *are* geography. "What Is The Universe Like?" stresses a study of the solar system, the development of the idea that our earth is only a part of the solar system, the solar system but a small part of the Milky Way galaxy and, that it in turn, is only one of the many galaxies in the great universe. Here also the student learns of the reasons for eclipses, and gains some acquaintance with the aids to astro-

nomical study. In the second unit, "What Is The Story of the Earth?," he learns about the natural forces of wind, water, ice, and growing plants, and also of the activities of man. He sees something of the development of life thru long eras of time, and gathers knowledge about the three classes of rocks of which the earth's crust is composed.

In Grade Eight, the pupil turns his attention to geography for nine weeks when he considers three units for three weeks each: Astronomy, Meteorology, and Conservation. The topics within these units are so familiar to you that I shall not list them.

However, as to the unit on Conservation within the elementary divisions, more should be said for, whether or not it is unusual, it certainly is unusually good. Nearly fifty elementary schools have active Park Protection Clubs. The programs of the individual clubs are devoted to a greater knowledge of the natural features and how to protect them. In 1947 the annual project was the planting of club-sponsored trees in a section of Gordon Park which was in need of reforestation. The testimony of adult citizens as to the noted improvement in many areas due to the activities of these clubs is sufficient proof of their vitality and value.

Passing to the secondary field, we find an even greater emphasis upon Conservation. While proud of this work, we in Cleveland could have more national pride if we felt that this work received equal emphasis elsewhere. In 1935 a course in Conservation was started at John Marshall High School. It was designed primarily for those boys beyond the tenth grade who would not desire to take physics or chemistry. It includes a broad program of field activities. Two plots within the wings of the school building were set aside; one as a formal garden and one as a wild-life safety zone. For more than two years, a teacher has given full time to the conservation projects in this school. Other secondary schools have done much also. At Collinwood High School, a club of boys and girls have managed a tree-planting program on a badly-eroded slope in Euclid Creek Park. In many schools the city's Conservation Week is observed annually. I can recall one year when an assembly program dealing with conservation was held daily thru-out this week at John Marshall High School.

In eleventh grade physical science, units are offered on "The Solar System," "Beyond The Solar System," and "Earth Sciences, Atmosphere, and Climate."

## OTHER SOCIAL STUDIES

The second page in the album shows the relation of geography to the other social studies in the Cleveland school system. I shall deal first with those in which geography receives a somewhat specialized treatment.

In the first three grades of the elementary division, pupils are taught to use maps which aid them in their study of such topics as the American Indian and his environment. In Grades four, five, and six, the emphasis is upon how people live in various areas of the world. The fourth year treats of the Congo River Basin, The Far North, The Nile Valley Today, The Nile Valley of Long Ago, Ancient Greece, Western Europe, United States, Andean Plateau, and Norway. There are supplementary units on the Amazon, China, Ancient Rome, and India, but I don't know where they find the supplementary time!

The fifth year deals with living in the New England States, Middle Atlantic States, Central States (with emphasis upon Ohio), and the Southern States. The sixth year introduces the child to life in the Western States, Possessions of the United States, Dominion of Canada, Mexico, Central America, the Caribbean Islands, and South America. While it would seem that the child is getting a full menu in geography in his fifth and sixth years, he is also supposed to relish history for one-half of his time.

The objectives in the Upper Elementary Social Studies (4, 5, 6) as they relate to geography are listed by the teachers' committee as follows:

1. To appreciate the fact that people the world over have need for clothing, shelter, work, and play.
2. To develop the realization of the increasing dependence of people upon one another for the necessities of life, and the increasing need for understanding and co-operation between individuals, groups, and nations.
3. To develop an appreciation for, interest in, and understanding of other lands and times.
4. To gain greater understanding of peoples whose culture differs from our own.
5. To develop the realization that the way people live, work, and play is due partly to the way they adjust to their environment and make use of their natural resources, and partly to their qualities and cultural heritage.
6. To develop an awareness of the nation's natural resources and a responsibility toward their conservation.
7. To develop functional skills and habits: to secure information from globes and maps relating to direction, location, latitude, altitude, rainfall, crop distribution, and population.

In Grade seven the pupil receives a real treat in his combined study of geography and history. Altho I know none of the authors of the text and am myself wholly uncorrupted and incorruptible as far as royalties are concerned, I must say that I cannot refrain from giving a "plug" to a book which makes a boy's and girl's study so delightful as does *The Old World and Its Gifts*. I only wish I might have read it before traveling in these countries. I believe all Cleveland seventh graders get a real appreciation of and a love for the world which was beyond them and which now seems so close.

#### EMPHASIS IN HISTORY

In the general history courses, that of the United States in Grades eight and eleven and that of World History in the tenth year, the pupil gets more than a passing glance at geography. Rather than saying that his history courses are spiced with geography, it would be more correct to say that they are saturated with it.

I hope that Cleveland teachers of history do not differ from others in that they rely almost completely upon geography to explain many of the great events of the past. How could they explain Switzerland's development of democracy without reference to its being "walled-in" by mountains? How could they explain our success in gaining independence without reference to the three thousand miles of water which separated us from the mother country? How, except by oceans, could they explain our practically unhampered attempts to develop self-government and our disposition to remain isolationists for so long? How could we explain the exodus from New England to the New West without a knowledge of the former's soil condition? How, except by geography, could we show why slavery became the "peculiar institution" of the South and not of the North? Who of them could trace the origin and development of the Industrial Revolution in England and the United States without turning to geography? How could anyone discuss the future of present-day Germany while ignoring geographic factors? Who could point up the difficulties faced in a Good Neighbor Policy without a knowledge of the physical factors and products of Latin America? These must suffice to show that we in Cleveland do not simply lean upon geography, we embrace it!

A visit to most history classes will show the remarkable extent

to which globes and maps are used by both teachers and pupils. The global-projection map is familiar to most of our pupils, and not many Cleveland boys and girls would think, as do so many adults in the United States, that only our coastal cities are vulnerable to an atomic attack. Many of our teachers, particularly those who are active in the Council on World Affairs, could discuss the system of geopolitics with those somewhat above the layman status in that field. They have heard the late Professor Spykmann of Yale and Father Edmund Walsh of Georgetown give their scholarly lectures, and they are not unfamiliar with the terms "World-Island," "The Heartland," and "The Coastlands" as they have been used by Sir Halford Mackinder and Karl Haushofer.

### ECONOMIC GEOGRAPHY

In six Cleveland high schools, a course in tenth grade Economic Geography is offered. In one school, it is required of technical majors and in one it is required of Industrial Arts and Commercial majors. In the spring of 1949, 1221 boys and girls took this course. This compares with 3533 in World History in the same grade; neither course being required in most schools. 77.6 per cent of the tenth graders were enrolled in social studies' classes, 18.8 per cent in Economic Geography and 54.5 per cent in World History.

Those who do not elect either of these courses in the tenth grade will elect modern problems, or sociology and economics in their twelfth year. Here again Geography serves to explain much as to industrial life, community life, and even the religious life of peoples. It helps students to understand why in some areas in some ages old people have been killed off because of the shortage of food. It serves to explain why in some area where food is perpetually scarce many female infants have been destroyed, and that the females who reach maturity may have more than one husband. This geographic fact interests at least one-half of any class and may even quicken a study of transportation facilities.

### GEOGRAPHY AND RADIO

Over WBOE, the schools' own radio station, the pupils have still another contact with geography. Sometimes these broadcasts are geography lessons, closely correlated with the course of study. Schools have sets of slides which are used in connection with radio lessons. Each Monday, the current news' program under the head-

ing "The News: Places and People" is made available to junior high schools. Many topics give much emphasis to geographic factors and some are almost exclusively of that nature. A sampling includes: "Crisis In China," "Indonesia," "Wanted: New Sources of Iron Ore," and "Revising Our Impression of Latin America." This program is broadcast ten times on Monday. The senior high program is broadcast on each Friday and it, too, gives emphasis to geographic factors. Some recent topics have been "A Cleveland Teacher Reports on Germany," "Exploring South America," "World Trade," and "Troubles of the United Kingdom."

#### TEACHERS' AWARENESS

Yes, the social studies' teachers of Cleveland have an awareness of geography. I wish that my teachers had been equal to them. In my grade school days, I thought of the geography text as a boy's best defense against having received a poor report card. When I was sent to a map to locate the Mississippi River, I fumbled around until I fell into it. How different from my little neighbor girl in the fourth year. Recently, my wife asked her what subject she liked best. "Oh, geography," she exclaimed, "we're studying all about Egypt and how the people live. Gee, I like it." On a Tuesday night's newscast this week, a girl from an eastern high school was being interviewed about her visit to the United Nations. "One thing I learned," she said, "is that we should throw away those old 1934 geography books we have in our school and get some new ones so that we could know something about the world as it is today." I hope that her school is unique in that respect.

I have sketched some of the things we are doing in Cleveland about geography in its relation to the social studies and the physical sciences. We know that a smaller world demands a larger citizenship, and we are using geography to make that ideal real. Like you, we shall ever keep before us the picture of that great fifteenth-century geographer, Columbus, who searched for a new and better way to an Old World and, in doing so, discovered a New World. If we but use the knowledge we have and summon the courage to be ever on the alert for new and better ways of reaching old goals, we, too, can bring our boys and girls into the harbors of a New World.

## VERBALISM LOOMS

JOHN HAYES EDWARDS

Roxbury School, Johnstown, Pennsylvania

Psychologists, in discussing the accomplishments of children in geography and history, frequently mention the ease with which young children learn to bandy words which are really meaningless to them. The geography teacher is very likely to encounter this kind of learning and may accept it at face value. Perhaps this is especially true of us because we are preoccupied with teaching the skills peculiar to geography, as map and globe reading, work with statistics, picture reading and interpretation, and the special reading skills necessary to geographic learning. Simultaneously, the geography teacher is generally confronted with what seems like an overwhelming load of factual material.

Avoiding this pitfall—verbalism—is the teacher's hardest task, since its existence surely nullifies all that we have attempted to do, all that we have been developing special geographic tools for.

What are some ways in which we may avoid this pitfall?

During the year children in sixth grade in most parts of the United States are expected to spend some time studying the textile industry of the United Kingdom and later encounter the same industry in lesser detail in such countries as France, Italy, India, Japan, and others. To say the least, the textile industry is highly complicated. Its understanding not only involves a comprehension of the natural items that have led to its development but the cultural items that have encouraged its growth. The process itself is intricate and requires a somewhat lengthy vocabulary, even to attempt a discussion.

As a beginning just what is a *textile*? To initiate the unit the children were each given several small pieces of cloth. These were pulled apart, exposing the pattern of horizontal and vertical threads. We decided that the process of putting threads together in this way to make cloth is called weaving, an idea suggested by the children from their background of weaving simple paper mats in the primary grades.

To establish this concept further in their minds, other pieces of cloth were distributed to the children; these patches did not come apart in the same manner, however. By grasping an end of thread, we were able to ravel the second kind of cloth. Thus, con-

cretely, we could see the difference between a textile—cloth that has been woven—and cloth that has been knitted.

But how is weaving done? This natural question on the part of the children brought forth experiences on their part with looms. In a few days, our room held a collection of looms—commercially made metal frames, picture frames with shoe nails at the top and bottom, and wooden boxes similarly equipped. Some of the children even brought extremely simple looms made of heavy cardboard with the top and bottom cut in points to hold the vertical threads in place.

This collection made it obvious that essentially a *loom* is a frame on which weaving is done. The children were aware, of course, that a commercial loom must be much larger and must operate much faster. Even with a darning needle to guide the *woof* through the warp, or a flat, wooden stick, weaving was slow and tedious. (The needle or stick, incidentally, was correctly identified as a *shuttle*.)

To get across the idea of the separation of the warp to allow the shuttle to pass thru rapidly, we constructed "Tee Dee Looms" as a class project. These looms are constructed of tongue depressors according to simple directions available from the Arts Co-operative Association, New York, for a nominal fee. Merely a shift in position causes the threads to form a *shed*, allowing the shuttle to pass thru freely and speedily.

Needless to say, the children were fascinated by the ingenuity of their construction and the words *loom*, *woof*, *warp*, *shuttle*, and *shed* were theirs and theirs with meaning for some time to come. Yet we were far afield from commercial weaving.

In many text and supplementary books there are pictures of looms and interiors of textile plants. How much do they mean to a child? One of the older texts goes so far as to say, "It is impossible to describe a loom if you have never seen one work."

Fortunately in Johnstown we have a textile mill, one that specializes in weaving silk and rayon ribbon. With some knowledge of vocabulary and simple processes as background, what could be more natural than a journey to the plant to see actual weaving.

After contacting the school authorities and plant officials for permission to make the visit, we made our plans. The route to the mill was simple and direct, involving a short streetcar ride. We decided that we should like to know: (1) Where does the mill get

its raw materials? (2) What is done to those raw materials in the plant? (3) What power runs the machinery? (4) Where are the finished products sent?

The planning and preparation for the journey also provided an excellent opportunity for the children to discuss what qualities of good citizenship, leadership, and followership, would be followed on the trip.

Armed with pads for sketching and note taking, we set forth to find the answers to our questions. At the plant, the children were impressed with the noise of operation, which soon receded into the background of their consciousness and was later compared to music by one of the boys. When questioned by the class which had not thought it musical, he replied that he was thinking of the rhythm.

The children observed the hanks of thread as they were when they entered the plant. They observed the looms in operation and had the parts pointed out to them, some of which they recognized. They followed the completed ribbons thru the final stages of checking for defects, receiving samples all along the way.

The days following our return were used to clarify any remaining questions about our experiences and crystallized in a group report which, in the primary grades would be termed an experience chart. This was hand printed by the class on large sheets of wrapping paper, illustrated with enlargements of their on-the-spot sketches, and bound into book form.

With such a background and a vocabulary with which to work, we were ready to attack the whys and wherefors of the textile industry of the United Kingdom. Our experiences paid dividends when we met the industry in other countries and when we studied the Industrial Revolution in history.

## ISAIAH BOWMAN

1878-1949

Dr. Isaiah Bowman, director of the American Geographical Society for twenty years and president of The Johns Hopkins University for the following thirteen years, died at Baltimore on January 6, a few days after his 71st birthday. The loss, not only to the geographical profession but to all who are concerned with the promotion of better understanding among men and nations, is incalculable.

No geographer was ever called upon by his government so frequently, or served it so untiringly and so fruitfully. Chief Territorial Adviser to the American Commission to Negotiate Peace after World War I; member of the Policy Committee of the Department of State, Chairman of the Department's Territorial Committee, and special adviser to the Secretary of State in World War II; member of the United States Delegation to the Dumbarton Oaks Conference and adviser to the United States Delegation to the United Nations Conference in 1945; and, finally, chairman of the Committee on Overseas Territories of the Economic Cooperation Administration—to mention some of the most important of the many posts to which the government called him. The whole geographical profession must take pride in the fact that, in all his services to the government, his contributions were always those of a geographer.

Dr. Bowman's work as director of the American Geographical Society was motivated at all times by his ideal that the Society should concern itself not only with the extension of the frontiers of geographical knowledge but also with public service and the national welfare. Evidence of his success in pursuing this two-fold ideal is to be found in the thirty-five volumes of the Society's Research Series and Special Publications published during his directorship, several of which were under his own authorship; in the numerous research projects carried out at the Society under his direction, many of which widely influenced government policy both here and abroad, as well as institution and individual research and exploration as, for example, the studies of polar geography, the studies of problems of pioneer settlement, the great Millionth Map of Hispanic America; and in the public service to which the Society and the members of its staff have frequently been called.

Equally scholar and administrator, man of vision and man of action, Dr. Bowman will long be remembered for the many enterprises for which his creative imagination furnished the inspiration, and his genius for putting ideas into action assured the maximum of results.

RAYE R. PLATT

## THE NATIONAL COUNCIL AT WORK

### The Distinguished Service Award

The Distinguished Service Award, the highest honor the National Council of Geography Teachers bestows, is awarded for outstanding service in geographic education. Every member of the National Council has the privilege of nominating a geographer for the award. Accompanying the nomination there should be a full statement of the services rendered geographic education by the nominee. Nominations must reach the chairman of the *Committee on the Distinguished Service Award*, Alison Aitchison, Iowa State Teachers College, Cedar Falls, Iowa, by June 1. Other committee members for 1950 are Harry O. Lathrop, Illinois State Normal University, Normal, Illinois, George B. Cressey, Syracuse University, Syracuse, New York, J. Russell Whitaker, George Peabody College for Teachers, Nashville, Tennessee, and Otis W. Freeman, Eastern Washington College of Education, Cheney, Washington. Ex-officio and voting members are the President, Loyal Durand, Jr., University of Tennessee, and the Secretary, M. McVinn Svec, State Teachers College Oswego, New York.

The Distinguished Service Award to date has been presented to the following persons:

1932 William Morris Davis	1941 No award
1933 Ray Hughes Whitbeck	1942 Ellsworth Huntington
1934 Almon E. Parkins	1943 Wallace W. Atwood
1935 Douglas C. Ridgley	1944 Gilbert Grosvenor
1936 Isaiah Bowman	1945 Alison Aitchison
1937 No award	1946 Richard E. Dodge
1938 George J. Miller	1947 Alice Foster
1939 Mark Jefferson	1948 Stephen S. Visher
1940 J. Russell Smith	1949 Edith Putnam Parker

### National Council Represented at Two Meetings

Miss Abigail Haldeman officially represented the National Council at the Aviation Education Conference of the National Education Association at Atlantic City, February 23 and 24.

Miss Helen Mixter, Supervisor of Geography in the Department of Education of the city of Baltimore, and Professor Emma Ehlers of the University of Delaware are the official delegates of the National Council at the meetings of the American Academy of Political and Social Science in Philadelphia on April 14 and 15.

### Additional Contributing Members and Fellows

The following eleven persons have become contributing members since the list published in the February, 1950 JOURNAL was compiled.

A. E. Burdick	Frances M. Hanson	Dorothy McClure	Otis P. Starkey
Nels A. Bengtson	Lucia C. Harrison	John W. Morris	Jane Tulloch
R. S. Funderburk	Warren D. Kress	Paul Porochniak	

Since January 1, 1950 eight new fellows have been designated. The constitution states that "a member in good standing for five or more consecutive years is of this to be designated fellow . . ." The new fellows are A. E. Burdick, Arkansas; A. Arkansas; Esther Aschemeyer, Indiana; Jeannette Strachan, Indiana; Sister Presentation, Iowa; J. R. Schwendeman, Kentucky; R. J. Scarborough, Minnesota; N. S. Holland, Texas.

LOYAL DURAND JR., and dis-

graphy Teach-

## EDITORIAL NOTES AND NEWS

Have you read Bulletin 1949 No. 12, "The Place of Subjects in the Asian Horizons, It is prepared by the Office of Education, Federal Security Agency, Washington, D. C. of distance more up hill or down.

## GEOGRAPHICAL PUBLICATIONS

Nels A. Bengtson and William van Royen. *Fundamentals of Economic Geography*, Third Edition. xxviii and 574 pp. Prentice-Hall, Inc., New York. 1950, \$5.75.

With the publication of this completely revised edition of *Fundamentals of Economic Geography*, the scanty list of suitable postwar textbooks in this field is valuably enlarged. Beyond its timely service in helping to fill an unfortunate lack, the book constitutes a refinement of the earlier editions for which the authors deserve high praise. The appearance of the book has been entirely changed. The page size is larger, affording use of the popular two-column format and permitting enlargement or redrafting of maps to more legible scale, whereas the type also is new, and much more attractive than that of former editions. The content has been rearranged and three chapters added, with good result. Treatment of climates and agricultural production has been advanced to the first part of the book, which seems best since the climatic regions provide a highly useful system or framework of world distributions for beginning students. A new chapter introduces the basic and helpful concept of recurring association of particular climates, vegetation types, and soils from place to place over the world; another emphasizes the important geographic viewpoint of regional synthesis with respect to the location of the industrial districts. A third new chapter, contributed by Peveril Meigs, analyzes the relations of transportation and regional development, and includes a new world map of transport forms. Data on map projections, land survey, and longitude-time relations are contained in an appendix which replaces the extensive (nineteen pages) list of references, perhaps illogical in an elementary text, which appeared in the 1942 edition. In the new edition the chapters close with lists of selected references almost unique in their up-to-dateness, but in contrast to the many sources in the French, Dutch, German, Swedish and Italian languages listed in the former bibliography, these almost without exception refer to the American geographical journals. The statistical content of the book is excellent, data in most cases being brought up to 1946-1949; the FAO in particular is doing yeoman's service for geographers in this respect. Large numbers of new, carefully plotted charts and graphs are used to illustrate recent economic tendencies. The analysis throughout is well-balanced, altho certain small items may be misleading to students. For example, the inclusion of a half-page map of oilfields in northwestern Germany, Burma is not mentioned among the oil producers, past or present. Careful editing and proofreading are evident in the very small number of cartographic and technical errors, of which only one deserves mention: the mistreatment, surviving in the present edition, of the name of Rawlins, Wyoming (p. 21). Such criticisms are in the whole this book provides an excellent and useful text for students of geography at the undergraduate level, and will certainly attract new members to the many users of preceding editions.

Willert Rhynsburger

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Equips ... *World Understanding Begins With Children*, Bulletin 1949, Bowman Federal Security Agency, Office of Education, 30 pp. For sale by imagination. Documents, Washington 25, D.C. 15 cents.

assured the ... suggests many sources of material suitable for elementary schools and materials. It is intended to encourage the teacher who is developing a understanding for the first time, and to point out ways in which the may supplement and extend her program. Its primary aim is to help said, "I want to do something about international understanding."

# The JOURNAL of GEOGRAPHY

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VOLUME XLIX

MAY, 1950

NUMBER 5

## CONFUSION IN ASIA\*

SHANNON MCCUNE

Colgate University

"All the scenery of the North  
Is enclosed in a thousand li of ice  
And ten thousand li of whirling snow.  
Behold both sides of the Great Wall—  
There is only a vast confusion left."

Thus Mao-Tse-Tung, the Chinese Communist leader, described his impressions in his poem, *The Snow*,<sup>1</sup> written after his first airplane flight. He went on to speak of "the charm of the rivers and mountains," likening the earth to a "blushing girl clothed in white." He concludes with the statement that tho in the past heroes "vied with each other in pursuing her" . . . "only today are there men of feeling." This conclusion is debatable. Certainly no debate can be made, however, over the beauty of the land of China, over the charm of the mountains and hills, or over the fact that there is only a vast confusion left.

Confusion seems to be dominant in the headlines as we look at Asia today. In the Far East the situation is certainly in turmoil as all of us realize. We are the Government of Japan, whether we like it, or even know it, or not. Headlines denoting recurring crises in China are in every issue of our papers. In Korea, the land with which I am most familiar, we see a hitherto unified peninsula cut in half by an artificial line, the 38th parallel. On each side of this line are "republics," recognized by the east or by the west, "republics" which claim jurisdiction over all Korea, vieing with one another for hill crests near the border, fostering intrigues and dis-

\* Presented at the Cleveland meeting of the National Council of Geography Teachers, November, 1949.

<sup>1</sup> The translation used here is that of Robert Payne as given in *Asian Horizons*, Vol. 2, No. 2, Summer, 1949, p. 18. The Chinese word li is a measure of distance more or less than one-third of a mile depending on whether one is going up hill or down.

sension within the midst of the other "republic"—a sad picture of confusion. In Southeast and South Asia the breaking of colonial bonds and the ensuing growing pains of nationalism have brought chaos.

Other parts of Asia have confusion. One can, for example, study the internal reorganization of life and economy within the Soviet Union, watch the developments towards union in Europe, or consider the conflicts of culture, religion, and the stage and state of economic development in the areas of Southwest Asia. Great confusion there is thruout Asia not just on "both sides of the Great Wall." What can geographers see in this confusion? Are there any basic factors in the background which influence and are a part of the geography of the continent and which need to be explained more fully?

Perhaps parenthetically, I should first note that there is some confusion as to the area which composes Asia. Some people divide the continent of Asia from Europe at the Urals. As Dr. Cressey has pointed out, that would be similar to making a division down the water divide of the Appalachians and making two continents out of North America. There is one super-Asia (Eurasia, Africa and Australasia) which would comprise much of the land area of the world. Within Eurasia are many Asias. There is the Soviet Union, the land-locked part of Asia. There is the Far East, the old, civilized part of Asia which was the center of the Confucian world. There is southeast Asia, the islands and peninsulas which were taken by the European countries in their days of overseas expansion and developed into colonial economies. There is the sub-continent of India, long civilized, an area in which ideas, religious and social, have more influence in the resultant geographic landscapes than in most other parts of the world. There is a dry Asia, the southwestern part of the continent, an area where nomadic and sedentary people are constantly clashing, an area from which many of our religions have sprung and now oil leaks. Finally there is European Asia, or Western Europe, an area of small countries with great advancement due in part to iron and steel based industrialization in recent centuries. Thus there are many parts of Asia, each one varied from the other parts, each area with certain unique characteristics. It is difficult, if not impossible, to generalize about them and the geographic factors behind their confusion. However, there are three basic and fundamental problems common particu-

larly to the areas of Monsoon Asia: the Far East, Southeast Asia and the sub-continent of India. These fundamental difficulties have influenced and been a part of the geography of Asia and have given rise to much of the confusion that now exists.

#### PRESSURE OF PEOPLE ON THE LAND

There is a terrific pressure of people on a tragically inadequate amount of useable land in Asia.<sup>2</sup> The result is low living standards, poverty, disease and unrest. So much of Asia is not fitted for cultivation because of physical factors: mountainous or swampy terrain, cold or dry climates, choking vegetation, easily exhausted and infertile soils. In parts of Asia, human efficiency is cut down by the ravages of malaria and other diseases. A low living standard seems to perpetuate itself thru the lack of education, the strangling hold of tradition and the inadequacies of capital accumulation. Much of Asia, whether we wish it so or not, is a desperately poor land. By taking the percentage of the total land area which is cultivated for the different areas of Asia we can see how little of the land is used. In Japan the figure is 15 per cent, in Korea 20 per cent, in China 11 to 19 per cent depending on the areas that one includes, in India 30 per cent, and so it goes. Asia is poor in useable land. Furthermore it must be remembered that thruout Asia most of the people get their living directly from the agricultural lands, from the limited regions of plains and low terraced hills. For example, 73 per cent of the Koreans get their living directly from the land, another 10 to 15 per cent indirectly.

One may well ask why such a great dependence on the agricultural land. Why not use other resources in the land? In general in Asia as a whole, the possibilities of resource development are limited. As I see it, Asia is not the great storehouse of minerals that it appears to some people. Handicaps of transportation, of terrain, of climate and of the real paucity and scattering of mineral resources are so numerous that I think we should not look at Asia's mineral resource position with great optimism. However, there are some important industrial developments which have taken place, and more that can take place. For example, in Korea, there has

<sup>2</sup> An important summary of data concerning Asia is given in the United Nations Publication, 1949. II. F. 1, *Economic Survey of Asia and the Far East, 1948*, prepared by the Secretariat of the Economic Commission for Asia and the Far East, Department of Economic Affairs, Lake Success, New York, 1949.

been some exploitation of mineral deposits of iron, coal, gold and many minor metals, considerable development of hydro-electric resources, thru the building of large dams, and construction of some large-scale manufacturing plants. But the potential to be realized in Korea and in Asia on any very great scale, equivalent to that in the western world will take many years. It will take much capital investment, much know-how which these areas lack. Many of the developments which did take place occurred as a result of Japanese desires to build an industrial economy for a military purpose. The reorientation of the economy to peace is a most difficult task. The future industrialization, not only of Korea but throughout Asia, must be guided toward peaceful objectives rather than take the disastrous course followed by Japan. With such limitations in land for agriculture and in mineral and power resources, the possibilities of relieving the population pressures on the land are correspondingly small. It is well for us to realize that stupendous efforts, particularly on the part of people within Asia, are necessary to have a substantial rise in the standards of living. Confusion bred of an inadequate base of land and resources appears inevitable for a long time to come in Asia.

#### POPULATION EXPLOSION

The second major factor which is common to many areas of Asia influencing the geography of those areas is the problem of the growth in the numbers of people in Asia. Some demographers have called this the "population explosion" which has taken place and is taking place in Asia. Without this factor, the problem of pressure of the people on the land would perhaps not be so severe. But populations are growing at a staggering rate. In Japan, for example, a million people are added to the labor force every year. In Korea, the population has doubled in the last thirty-seven years and if the present rate continues it will be less than thirty-seven years before it doubles again. Estimates are that in China, given peace (a prime requisite), given adequate transportation (so there isn't starvation in an area fifty miles away from an area of food glut), given public health (so that epidemics will not take their toll), then, using the data from Formosa which had those conditions prevailing, China's population would grow between fifty to ninety million people in ten years. India can be taken as an example of an area where population explosion has already taken place.

In India the population grew from 1931 to 1941 from 338 million to 389 million people. This is a growth of 51 million people in ten years. It is no wonder that Britain let go of such a fast-growing child.

The rate of increase shown by these figures is phenomenal, especially when one considers the small amount of additional land which has been made useable for food. It is obvious that a major result has been deepening of the poverty of the mass of the people. Much of this increased population has gone into the cities. In cities and industrial areas there is apt to be a falling off of the rate of growth. However, this takes a long time to take place. There is a lag before the population, even under urbanization and industrialization, will slow up in its growth. Population explosion is a major factor in the background of confusion in Asia.

#### THE WESTERN IMPACT

The third fact is that Asia is, perhaps obviously, now an integral part of the world. Isolation is no longer possible and with this loss of isolation have come tremendous impacts from other parts of the world. As the proverb says: A polar bear coughing at the north pole stirs the sands of the Sahara. Most of the impact on Asia has been from the west: Western ideas of political systems, social customs, religions, western ideas on land utilization, of industrialization, of modern transportation. Of course there has been an interchange. Some Asian ideas have come into our own life. Asian products like soy beans and tung oil have been introduced into our agricultural system. Asian rubber and various other commodities are being brought into and made an indispensable part of our own economy. But most of the impact has been the other way. This shattering of Asian economy and of Asian political and social life by western impacts is extremely important in analysing the confusion which we have in Asia. Some of this impact resulted in colonial domination by European powers and later America over different areas, particularly of Southeast Asia. The interesting thing is that along with colonial domination came western education with concepts of democracy and of nationalism. Today, to some extent, the independence movements which are seen in Asia have had their seeds in Western education. Freedom from colonial domination has been a rallying cry thruout Asia and has led to some of the confusion that we have had.

Another western impact has been in the field of economy. The west has introduced new ways of utilizing the land. The development of industrial potential by the exploitation of minerals and production of certain agricultural crops has been important tho not so greatly developed as one might wish. In some cases this industrialization resulted in the exportation of the product from the area rather than the development of industrialization within the area. At a later stage, however, there has come some industrialization internally. For example in India the largest steel plant of the British Empire was built as a part of an industrial empire of considerable proportion. Sometimes the industrialization on western patterns is incongruous to Asian scenes. I well recall in the Korea of the Far East seeing the large hydro-electric power lines swinging across the sky far above a simple rural landscape of pine-covered hills, thatch-roofed homes and emerald-green paddy fields. Vivid in my memory is the view in the State of Korea in India of modern coal mines set in the midst of a tropical jungle-forest. (By the way, did you know there were two Koreas in Asia, both interesting to a geographer.) Yes, industrialization has brought with it many, many problems adding to the confusion of Asia.

In addition to that, modern transportation is a major modifying factor in the life of Asian people. Modern roads, railroads, airlines, modern ocean and river transportation systems have been developed in some, tho still too few, Asian lands. This transportation has opened up Asia to the outside world. It has been instrumental in enabling the exchange of products, in fostering specialization in production in some places. It, too, has added somewhat to the confusion now found in Asia.

These three factors are of crucial importance in Asia today. The pressure of people on the land, the population explosion and finally the impact of the west have affected all the areas of Asia. They have resulted in Confusion in Asia.

#### BASIC GEOGRAPHIC CONCEPTS

How then shall we as Americans, and, more particularly, as American teachers of geography look at this confusion in Asia. We can by reading our headlines, see that confusion is there. By a certain amount of study we can further see some of the basic causes for this confusion. Is that enough, or should we go further? I think that our responsibilities are such that we must do much

more than we have in the past in considering the area and problems of Asia. The following geographic concepts may be obvious but they are important for Americans to grasp. Asia's continental patterns, its regional diversities and the place and function of Asia in the global frontier need to be made a part of our common knowledge.

We need to study with great concern and to teach our friends, colleagues and students with increased effectiveness the geographic patterns which have been and are developing in Asia. The great continental pattern needs to be stressed. Asia has a great mountain and desert core that separates the various realms from each other. Each realm of Asia, instead of being tied with the other realms of Asia, because of geographic factors of climate and land form, is looking outward. There is a centrifugal movement instead of a centripetal movement within Asia. There is a lack of coherence in the parts of Asia. Each differs in its geographic characteristics. Thus each approaches its problems in different ways. The great realms, separated from one another by physical barriers have had divergent development. Today some of these barriers are being broken down, ideas, always light baggage, are moving quickly thru the ether, airplanes can fly over areas like the Himalayan Hump, new rail lines are being constructed into the interior. However, these changes do not come over night.

Secondly, there is great need to recognize the regional diversities within the various realms of Asia. To take the specific case of Korea as an example, there is a great deal of difference between North Korea and South Korea and also within northern Korea and within southern Korea. This regional diversity is an important factor in Korea. If a line is drawn, as has happened in the choice of the 38th parallel, which provides an iron barrier between the north and the south, it shall not be surprising to see the different parts, which have latent geographic differences, grow further and further apart. So also there are regional differences in China. It is worth noting in the coming months whether the regional pattern which the Chinese communists have proclaimed will be effectively organized. In southern Asia the most striking examples are the tremendous geographic diversities between eastern and western Pakistan. The unions in Indo-China and Indonesia tie together geographic regions of great contrast. This problem of regional diversity in Asia is one that needs careful examination for each of the various parts of

Asia. I think that most geographers are familiar with these regional factors of diversity. The tragedy lies in the fact that people without geographic knowledge do not consider them important. The results are 38th parallels, odd and perhaps unstable political alignments, and so on.

Not only must there be consideration of the patterns and regional diversity within Asia but Asia in its setting in the global situation must be given intensive study. Today much of Asia lies on the international frontier between the world of the Soviet Union and the world of America. The boundary lines are drawn thru Japan, Korea, and China and all thru southern Asia. Just as any frontier needs understanding on both sides in order to be a peaceful frontier so this international frontier between the Soviet Union and ourselves needs understanding on each side. The battles on the frontiers are continually going on. Nowhere is there a segment more closely guarded and at the same time poorly defined by natural features as the segment of the international frontier in Korea, the 38th parallel. It was chosen for one limited military purpose, the acceptance of the surrender of Japanese forces, and used for another, the limits of zones of military occupation and later of the "republics" set up on each side. Over this line battles have been waged, on each side a hitherto quite unified people have been driven by the forces of circumstances to quite different objectives and patterns of life. The Koreans against their wills are pawns in a game of global power politics. Solutions must be found for the resolution of U.S.S.R. and U.S. rivalries, or Asia, situated on the frontier, will long be in chaos. The implications of these geographic factors of varying patterns, regional diversities and global frontiers must be made clear to all Americans and teachers of American geography have a real challenge before them in this regard.

Another important aspect of Asian geography which should be of concern is in the field of appraisal of the significant resources in Asia. There needs to be known pretty clearly, not only the patterns which have developed and are developing, but the potentials for the future. Geographic planning within Asia is a necessity. Asia is not a land which is just "hot and exotic" as some people term it. It has much diversity. It has considerable potential. A frank estimate by American, and more important Asian, geographers and others of the potential resources, needs to be made. Once having gained this geographic knowledge of Asia then the problems will be much

better understood; less confusion will result. This is indeed a challenge, particularly for those members of the American geographic profession who are interested in research, field work and the practical application of geographic knowledge.

Moreover, there needs to be much more geographic understanding of Asia, on an individual basis as well as a national basis. The basic problems that were discussed as confusion causants are not recognized. The patterns and the resources which are present in Asia are not appreciated. The status of geographic knowledge of Asia is woefully inadequate for Americans, reluctant citizens of a new world power. I think that this need for a better understanding of the geography of Asia is a supreme challenge for teachers of American geography. It can be accomplished in our teaching. In our writing we need to give it a higher priority than we have in the past.

Not only do Americans not understand the geography of Asia well enough, the people of Asia, who after all have the final decisions as to what happens in their lands in order for their confusions to be resolved, do not have the requisite geographic understanding. They need very definitely better trained geographers within their countries. They need to have more geography and better geography in their curricula. They need to have a continuing flow of geographic knowledge given to them. Their teachers of geography find it difficult to train their students for better citizenship as they face the unexplored future. In helping them meet this need, American geography teachers can do much. We can have better exchange with our colleagues in Asian lands. We can furnish to them such guidance as we can on the basis of our experience and our research. The new methods of geographic teaching which we are developing should be shared with our Asian friends. Some of this has been accomplished. Much more should be accomplished.

Undoubtedly there is confusion in Asia. This confusion can be resolved, however, by concerted attack thru many different approaches. One of the approaches, obviously stressed in this paper, is the approach thru better geographic understanding. Thru understanding better the geographic situation in this important part of our world we Americans can perhaps more effectively do our part in bringing order out of the confusion in Asia. Moreover, American geography teachers have a challenging responsibility in aiding our Asian colleagues as they endeavor to improve their teaching of the

geography of Asia for their citizens. Vast confusion there is in Asia not only on "both sides of the Great Wall." We should accept our responsibilities and meet the challenges before us. We should show that we also today are "men of feeling."

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## POLAR ESKIMOS OF GREENLAND AND THEIR ENVIRONMENT

WILLIAM E. POWERS

Northwestern University

Altho the Polar Eskimo of Greenland and his mode of life were sketched in masterly fashion by Ekblaw<sup>1</sup> more than twenty years ago, his descriptions applied to the period before any important changes had been wrought by contacts with Europeans. It is believed that many people today will be interested in a summary of the Eskimo's ancient mode of life, particularly his consummate use of his resources and environment, and a statement of the changes that are occurring as a result of European contacts, introduction of outside goods and a trading economy, and the disturbing impact of military activities.

### THE ESKIMO IN SOUTH GREENLAND

The primitive Polar Eskimos at the far north of Greenland are very different from the south Greenland Eskimos who live along the west coast south of Melville Bay. The former group was unknown until 1818, but the south Greenland Eskimos have had contact with Danes and Norwegians since the modern colonization of Greenland under the missionary, Hans Egede, in 1721. Previous Icelandic settlements started in south Greenland in 986 A.D. by Eric the Red prospered for a time, but they had disappeared during the fifteenth century.

For two centuries, European whalers and sealers in south Greenland waters regarded the Eskimos as savages and no attempt was made at further colonization until Hans Egede brought a small band from Norway in 1721. Since 1780 Denmark has controlled

<sup>1</sup> Ekblaw, W. Elmer, "The Material Response of the Polar Eskimo to Their Far Arctic Environment," *Annals of the Association of American Geographers*, vol. 17, 1927, pp. 147-198; vol. 18, 1928, pp. 1-24.

Eskimo government and trade. In this period the south Greenland Eskimos have lost many primitive ways of life and have acquired such life patterns as considerable use of cloth for garments, village life of permanent huts, the use of firearms, and a general acquaintance with articles of luxury and with disease.

### THE POLAR ESKIMO

The north Greenland or Polar Eskimos were first discovered in 1818 by Sir John Ross. They then believed themselves the only people in the world, having no records of contact with their brothers in south Greenland. They were living in very primitive fashion with stone, bone and ivory weapons and with meat practically their only food. Even today, these Eskimos still retain many of their original characteristics.

The Polar Eskimos are scattered along the west Greenland coast north of Melville May, from Cape York north to Inglefield Gulf, and formerly even to Etah and Anoritok. They numbered probably not more than 200 when discovered in 1818, about 250 during Peary's explorations fifty years ago, and about 350 at the present time. Their small number reflects their harsh environment. Death thru hunting accidents, starvation, and exposure or mishaps during cold season travel were numerous, while their birthrate was and is small.

Knowledge of the Polar Eskimo has accumulated slowly but steadily. Explorers of the period of Arctic exploration following 1850, including Charles Francis Hall and Elisha Kent Kane, revealed much concerning the personal traits, possessions, and mode of life of the Eskimos.

Knud Rasmussen during the early years of the 20th century made classic ethnologic and cultural studies. Peary and his associates including Commander Donald MacMillan, contributed largely to the subject. W. Elmer Ekblaw, botanist and geographer of MacMillan's Crocker Land expedition of 1914-18, published descriptions of the Polar Eskimo of that period that have never been excelled. Other scholarly contributors have included Dr. Therkel Matthiassen and Dr. Kaj Birket-Smith. The descriptions of the Polar Eskimo by these writers and others are largely scattered thru scientific journals and books of Polar exploration in which they rarely come to the attention of the ordinary reader. Therefore it is the purpose of the present writer to draw together and sum-

marize significant aspects of the Polar Eskimos' ancient mode of life, and to point out to what extent these are now being changed under the impact of European influences.

#### ENVIRONMENT OF THE POLAR ESKIMO

The environment of the Polar Eskimo from ancient times has been exceedingly harsh and forbidding. Greenland north of Melville Bay is a plateau from 1,000 to 2,000 feet high, largely covered by the interior ice cap which discharges to the sea thru narrow valley glaciers. Deep fiords indent the plateau margin. Low flat areas are few and small. Soil is lacking over much of the area and bare rocky ledges, cliffs, boulder-strewn uplands, and steep talus slopes abound. These conditions, together with the harsh climate, limit very strictly the vegetation.

The vegetation is a tundra. The only trees are low creeping twigs or mats of birch and willow, too scarce to be used as fuel. Grasses of several types and numerous small flowering plants occupy boggy areas and spots of soil. Most of these plants are xerophytic, for available water is scarce, being tied up in ice during most of the year. Lichens cover many rock surfaces including the stones in talus slopes, but they grow very slowly. No food plant is available to the Eskimo, but during times of starvation it was the practice to scrape lichens from the rocks and boil them into a sort of paste which was eaten. The only vegetable food eaten by the primitive Eskimos was the stomach contents of caribou when killed during the hunt.

#### HUNTING AND THE FOOD PROBLEM

In the absence of plant foods, the Eskimo life was based on hunting and this in turn centered upon the sea. Land animals were not adequate to supply their needs. The musk-ox and caribou were sparsely distributed and uncertain as a food supply. Arctic foxes and hares were trapped and eaten, and a considerable reliance during the summer was placed on migratory sea birds which came to nest in the rocky cliffs and talus. But the above foods were merely supplementary to the staple diet of seal, walrus and narwhal.

Of these the seal was the most numerous and widely distributed. Several types were captured including the small spotted seal and the larger hair seal. All these marine animals were hunted with the harpoon and, during open water, with the kayak or skin boat. The

harpoon possessed a detachable ivory point to which a long thong and inflated sealskin float were attached. When the harpoon was hurled into an animal the shaft floated free and was recovered by the owner. The thong and float attached to the embedded point prevented the animal from escaping. Great skill was needed in approaching the wary seal and walrus. With the kayak a white skin screen was often placed at the front of the craft to simulate a mass of floating ice. In fall when the seals were accustomed to lie on the ice near their holes, the Eskimo stalked them by pushing ahead of him on runners a similar whitened screen.

Walrus hunting with the kayak involved approaching to within a few feet of these large animals in order to make good the harpoon throw. In many cases this involved great danger to the hunter, for the walrus fought fiercely when attacked and not infrequently succeeded in turning the tables on the Eskimo. The narwhal was hunted both with the kayak during open water and around breathing holes during the winter. The long tusk of the narwhal, known as the unicorn horn in Europe during the Middle Ages, was used originally for spear shafts and similar purposes.

Another important animal to the Polar Eskimo was and is the polar bear. Altho sometimes found on land, the bear lives mainly on or in the sea where he feeds mainly on seals and fish. When encountered on land or pack ice the bear is easily killed by the Eskimo with little risk to himself. The dogs when released surround and engage the bear so that it is possible for the hunter to approach closely and dispatch the bear either with spears in ancient times or today with a rifle shot. Bear skin pants are worn by all male Eskimos in north Greenland and the robes are used for bedding.

#### THE UNRELIABILITY OF A HUNTING ECONOMY

Altho the Eskimo ate well when game was abundant, periods of want and famine were also frequent. The dogs, essential to his mode of life, consumed a great deal of meat, even tho it was the practice to feed them only once a week during the summer and not more than two or three times a week in the winter season. The movements of walrus, seal, and narwhal were uncertain and unpredictable. Surplus meat was stored under piles of rocks where it was safe from all marauders except the polar bear. Supplies of birds were preserved in sealskins with the blubber left inside. However, it was not only difficult for the Eskimo to lay in sufficient food for

his winter needs, but his improvident use of food largely prevented security for the future. It was the Eskimo's custom to gorge himself when food was at hand. When all the food in his hut or village was eaten then all Eskimos packed their meagre belongings on their sleds and moved to another village in the hope that meat was still present at the latter. If so, the newcomers shared equally with those who had secured the meat, until it also was all gone. The dogs were not only essential in travelling the long distances between such villages, but also formed a reserve food supply which could be drawn upon in times of starvation.

Summer hunting with the kayak was best. Originally the Eskimo had only a crude lance made with shaft of narwhal tusk. His encounters with the walrus were often fraught with danger, and if the hunter lost his life in such an encounter, his family, if isolated, was nearly certain to starve. Even the loss of a lance sometimes led to the same result. At one time the Polar Eskimo had even lost the art of building kayaks, presumably thru the death of all mature hunters, and great difficulties were experienced in hunting sea animals until a fresh migration from Baffinland again brought the kayak and knowledge of how to build it.

During winter hunting was doubly difficult inasmuch as the ice prevented the use of boats and the game animals appeared only in open leads of water or at the blow-holes which they kept open for breathing purposes. When a walrus was harpooned from the edge of such a blow-hole, often a terrific fight ensued in which other walrus collaborated in their attacks on the hunters who were endeavoring to draw their companion out of the water. Seal hunting was also very difficult in winter inasmuch as the seal established numerous blow-holes which became obscured by snow. When one or more of these was located with the aid of a dog it was then necessary to guess which hole the seal was likely to use during the next few hours. A small float and ivory pin were placed in the hole selected to indicate the approach of the seal. It was not unusual for the Eskimo hunter to stand for many hours, spear in hand, waiting for the approach of the seal, and then perhaps to go home empty-handed in the end.

Narwhal were scarce during the winter season, altho occasionally the rapid freezing of new ice crowded large numbers of these animals into one central blow-hole where they were forced to surface every fifteen to thirty minutes to get oxygen. All Eskimos

within many miles rushed to such a place and frequently harpooned large numbers of the unfortunate beasts.

Generally speaking, however, hunting was poor during winter and formerly want and starvation were not infrequent. Indeed, starvation may have been one of the principal modes of death.

#### MATERIAL POSSESSIONS OF THE ESKIMO

Previous to their discovery in 1818, the Polar Eskimos appear to have pursued their primitive mode of life for many centuries. Their only wood was driftwood, mainly fragments. Ivory and bone were used for harpoon shafts, tent poles, knife handles, kayak frames and sleds. Sled runners were made of fragments of bone or driftwood carved to fit together and lashed with rawhide thongs. Stone points were used generally for weapons. Snow knives were made of slate. However, small bits of meteoric iron secured from near Cape York were hammered into suitable form to tip harpoons or, inserted in narrow grooves, to form the cutting edges of ivory knives.

The hunter's knife resembled our carving knives, but the women's knife had a semi-circular blade similar to chopping knives of today. This knife was used for the cutting of skin garments, scraping and preparing hides, and chopping, as well as preparing food.

Heating of the igloo was by an oil lamp of soapstone, carved into a flat shallow dish. Blubber in the dish was melted and fed a wick of peat or moss placed along one side. When properly trimmed this wick gave a clear yellow flame without smoke. The stone and wood igloo used as the permanent winter habitation and the snow iglooyak used on the march, were nearly airtight above and were entered from the side or below by a tunnel. A single lamp often kept the air temperature near the ceiling at 80° or 90° F., even tho temperature at floor level was zero or below. In summer the stone igloo was thrown open and abandoned in favor of a skin tent or tupik which was airy and clean.

Dress consisted wholly of skins prepared, cut and sewn by the mother. The necessity for securing different types of skins for special purposes—bearskins for pants, caribou skins for winter coats and sleeping bags, birdskins for undershirts, hair sealskins for boot soles, et cetera—was partly responsible for the continual shifting of habitation from place to place, for certain animals fre-

quented certain known localities. Clothing was cut with considerable skill, according to established patterns of long standing, and sewn with sinew from the back muscles of narwhal or caribou. Such seams were watertight and strong.

#### IMPACT OF CIVILIZATION ON THE ESKIMO'S MODE OF LIFE

Up to Peary's time, but little change had occurred in Polar Eskimo life. Limited amounts of wood and metals from the early explorers and their wrecked vessels enabled the Eskimo to improve his hunting gear, but no change occurred in his pattern of life. Peary supplied the Eskimo families that helped him with considerable supplies of wood, food, guns and other weapons, needles, thread, cloth, matches, and other attributes of civilization.

Within the decade following Peary's successful attainment of the Pole in 1909, the Danish government allowed the establishment of a trading post at Thule (formerly Umanak) on North Star Bay. By the second decade after Peary, other trading posts were established at Savigsivik and Siorak-pa-doo. In these, as in south Greenland since 1780, the Danes have rather rigidly controlled prices charged as well as prices paid for such Eskimo products as blubber, skins, ivory, and feathers. Intoxicating liquors have been rigidly banned. Prices charged for staples such as cloth and flour have been held low, sometimes below cost, while prices charged for such luxury items as tobacco and candy have been relatively high. Such practices have been in the interests of the Eskimo.

The availability of trade goods has had considerable effect on the Polar Eskimo's pattern of life. Better weapons have enabled him to slaughter more game than formerly, and some animals—particularly the caribou—have become scarce. Luxuries have taken earnings that could better be spent for food and clothing, and health has probably suffered from this cause as well as the introduction of the white man's diseases. Teeth, in particular, have deteriorated badly. Having discovered the reluctance of the white man to let them starve, the Eskimos have been drawn toward the villages, particularly Thule, and have in considerable part adopted permanent huts in which they reside the year around. It is to the Danes' credit that they have strived to enable the Eskimo to earn his living, and they have supplied limited medical attention and education. The value of the latter is dubious in the Eskimos' present state of development. The basic changes have been from a pure

primitive hunting economy to a semi-commercial economy, and to a more fixed rather than a nomadic mode of life.

### THE EFFECTS OF WORLD WAR II

The establishment of an air base and weather station at Thule during World War II, and contacts with occasional naval and military groups, have been unsettling influences. Large amounts of supplies have been given away or wasted by these outsiders, and both the Eskimo's economic pattern and his ideas of economy and frugality have been badly shaken. A readjustment to the former sparing standard of living is going to be very difficult.

The future of these children of the north is difficult to predict. They have increased since Peary's time from 250 to nearly 350. If a closed and stable trading policy, with exclusion of outsiders, can be maintained here by the Danes as in south Greenland since 1780, the present semi-commercial economy will probably allow a considerable increase in numbers. If, however, Polar Greenland is thrown open to outsiders and the Eskimos are placed in competition with newcomers from Europe, they are likely to succumb or to be submerged as a racial group.

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## WILLIAMSON AND FRANKLIN COUNTIES—COAL COUNTIES OF SOUTHERN ILLINOIS

ARTHUR H. DOERR

Northwestern University

In certain parts of Southern Illinois, coal exerts a tremendous influence on the local populace and indirectly influences lands and peoples outside the geographic limits of Southern Illinois. Within Southern Illinois coal is especially important in Williamson and Franklin counties.

These two counties form an area roughly rectangular in shape located about 75 miles southeast of St. Louis and 275 miles south, southwest of Chicago (Fig. 1). Centrally located in the crotch of land formed by the Mississippi, Ohio, and Wabash rivers, the center of the area lies roughly 50 miles from the southern tip of the state.

The combined area of the two counties is 875 square miles, which is about two-thirds the area of Rhode Island. Areal extent, how-

ever, has no influence on the importance of this area to the state and the nation. This area's importance revolves around one commodity, coal. Here the coal beds of Illinois reach their maximum thickness and quality, and here coal mining has reached its greatest development within the middle west.

Few visitors to the area can long be in doubt as to the major activity. On a drive along the highways in any direction mines,

abandoned mines, "gob"<sup>1</sup> piles, and "spoil"<sup>2</sup> heaps are rarely out of sight. Mines and associated features are continuous and repetitious features of the cultural landscape. The many smoke stacks, mine tipples, and rising smoke from the chimneys might give the inexperienced observer the impression that this is a region of heavy industry. Whereas, in reality the main function of the area is to supply fuel for heavy industry located elsewhere.

The coal industry in Williamson and Franklin counties is of no mean proportions. Indications of its size

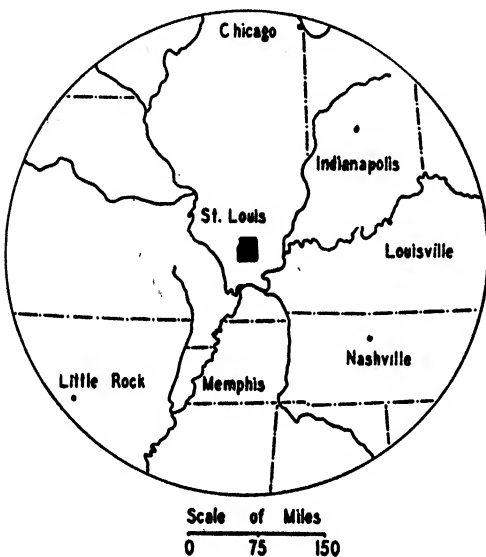


FIG. 1. Map showing the location of Williamson and Franklin Counties (Shaded area indicates the location of Williamson and Franklin Counties)

are grasped when it is realized that the average annual production is in excess of 15,000,000 tons. With average sized freight cars this annual production would fill a freight train 2,400 miles long. Other indices point to its position as an important industry. The largest shaft coal mine in the world is located near West Frankfort in Franklin County. The yearly production of this mine is more than 2,000,000 tons. The world's record daily hoist achieved at this mine was 15,174 tons.<sup>3</sup> Six other mines in the area annually produce more

<sup>1</sup> Gob is the term applied to waste coal, shale, and other rock.

<sup>2</sup> Spoil is the earth material removed in strip mining.

<sup>3</sup> Griffith, Will and Catherine, "Egypt's Coal Bucket," *Egyptian Key Magazine*, Carbondale, Illinois, Oct., 1943, p. 29.

than a million tons.<sup>4</sup> The largest bituminous coal preparation plant in the world is located near Zeigler in Franklin County.<sup>5</sup> (Fig 2) Coal mining mechanization has progressed further here than in any other area in the midwest.

Coal is highly important in supporting the hinterland population of 200,000, which makes up the third largest urban agglomeration in Illinois. More significant from an economic standpoint is the effect which this Southern Illinois coal has on other areas.

#### MARKETING

Markets for coal produced in this area are quite widespread and are in constant state of flux. The market area for Southern Illinois coals at the present time is bounded in the following ways.<sup>6</sup> On the west the line is near the eastern boundary of North and South Dakota, Nebraska, and Kansas; on the east the line practically coincides with the state line between Indiana and Illinois; on the north the line runs thru southern Wisconsin and Minnesota; on the south the line follows the Ohio River and thence in a westerly direction until it meets the western boundary in Kansas (Figs. 2, 3). These lines are by no means distinct, but rather repre-

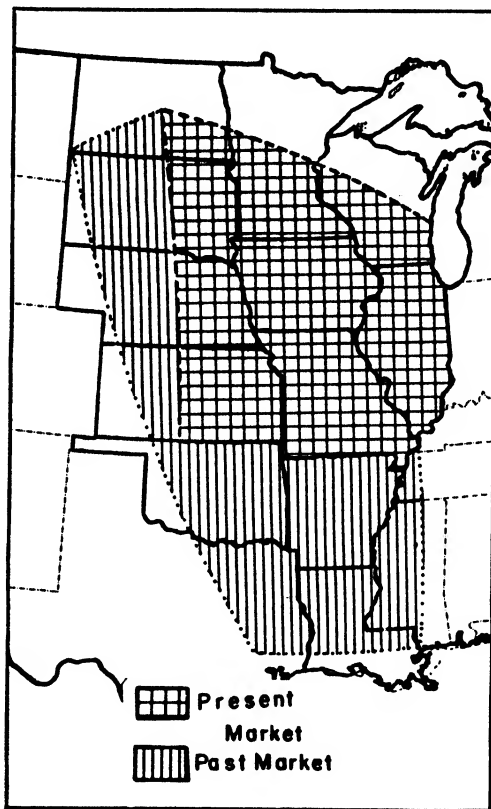


Fig. 2. Map showing the past and present market area for Williamson and Franklin County Coals.

<sup>4</sup> Unless otherwise noted coal production figures taken from, Illinois Coal Report for 1946, Illinois Dept. of Mines and Minerals, Springfield, Illinois, 1947, pp. 155 and 171.

<sup>5</sup> Information received from Bell and Zoller Coal Co. Verification of this claim or counter claims is difficult because of different criteria used for measurement.

<sup>6</sup> The market area as defined in this paper is that region which most consistently buys the largest amounts of Southern Illinois coals.

sent broad zones of transition and may vary considerably from year to year.

A number of factors have combined to establish the present lines. On the west the line is drawn at the place where coal produced in Southern Illinois can successfully compete with coal which is produced in Colorado, Montana, and Wyoming. On the north the line is again a competitive one; in this case between the coal produced in Pennsylvania, West Virginia, and eastern Kentucky, and

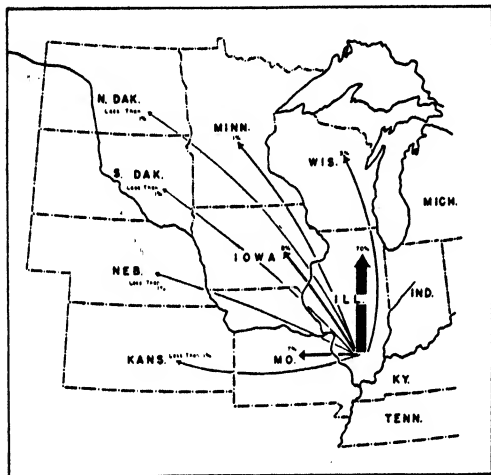


FIG. 3. Map showing approximate distribution of Southern Illinois coals to states within the coal market area.

that which is produced in Southern Illinois. (Coal from the West Virginia, Pennsylvania area comes to the Great Lakes ports on the returning iron ore boats; and then comes into competition with Southern Illinois coals, which are shipped into the area by rail.) On the east the line is competitive; here competition is between coal produced in Southern Illinois and that which is produced in the Indiana field. The southern boundary is more complex than the others, and has been delimited

for a variety of reasons. In its eastern section the line is a competitive one between Southern Illinois coals and coal produced in western Kentucky; in its central and western portions the big limiting factors have been the easy availability of oil, natural gas, and Arkansas anthracite in that section.

Within the market area thus delimited is marketed 90 per cent of the coal produced in Williamson and Franklin counties. Of the remaining 10 per cent the destinations are quite varied. Perhaps as much as 3 per cent is sent to overseas destinations, primarily to European markets.<sup>7</sup> The coal moves out via rail and river to the ports of Pensacola and Mobile, and thence overseas. Small amounts of coal get into northwestern Indiana and southwestern Michigan

<sup>7</sup> Information received from Mr. H. H. Taylor, Pres. of the Franklin County Coal Corporation.

to supply fuel for industries located there. Minor amounts are sent to some of the states of the lower Mississippi Valley.

The market for Williamson and Franklin county coals (as well as that for other parts of Southern Illinois) was formerly much more extensive than it is at the present time. (Fig. 3) The states of the southwest, which once used large amounts of Southern Illinois coals, now use almost none. Increased production of petroleum, natural gas, and by-products from refining have been in large measure responsible for this large market loss.

Coal was formerly sent down the Mississippi River to states in the lower Mississippi Valley in much greater quantity than at the present time. With the completion of the Warrior Canal, coals from Alabama largely supplanted those of Southern Illinois in this area.

The gradual shrinkage of the western boundary has been due mainly to the increased production of the western states.

Another loss more significant than all of these occurred when in 1940 the St. Louis Board of Alderman passed a smoke control ordinance. For a short time Southern Illinois coal was practically eliminated from this important market, but with better preparation methods a considerable amount of this loss has been reclaimed.

Southern Illinois coal operators became more aware of an axiom which Walter Voskuil, a coal expert, had uttered several years previously. "The salvation of the coal industry lies in its having become distribution minded. Distribution-mindedness gives rise to creative merchandising, and the expansion of creative merchandising with its relatives of product research, market analysis, breakdown of sales costs, lowering of sales resistance by determining the geographical supremacy areas, effectively and intelligently selected markets, and directed promotion form perhaps the strongest counterforce that the coal industry can set against narrowing margins of profit and decreased volume of business."<sup>8</sup> Attempts to improve the saleability of the coal by washing, screening, and oil treating have all been tried with varying degrees of success. It is difficult to say whether these former markets will ever be regained. If an oil shortage occurs, it seems reasonable to assume that some of the old markets for Southern Illinois coal will be regained.

<sup>8</sup> Voskuil, Walter H., "The Competitive Position of Illinois Coals in the Illinois Coal Market Area," Bulletin No. 63, Ill. State Geol. Sur., Urbana, Illinois, 1936, p. 10.

## TRANSPORTATION

Without an adequate transportation net there could be no coal industry of any appreciable size, regardless of the amount of coal in the area, or the potential size of the market. The establishment of transportation lines increased the market for coal, and in turn the establishment of new mines has influenced the growth of the

transportation net.

This sort of reciprocity exists between mining and transportation routes.

Even a brief glance at the tight mesh of railway lines in Williamson and Franklin Counties indicates great activity of some kind. All of Southern Illinois is well supplied with railroads, but the net is especially dense

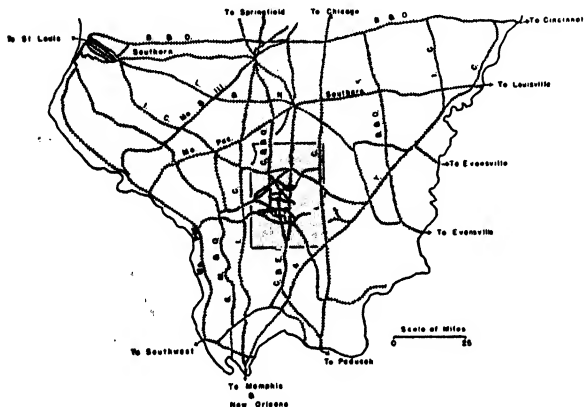


FIG. 4. Map showing the rail net of Southern Illinois (Shaded area indicates Williamson and Franklin Counties.)

within the boundaries of Williamson and Franklin counties. (Fig. 4) This area not only has good main line connections, but many miles of siding as well. The Illinois Central; Missouri Pacific; Central and Eastern Illinois; Chicago, Burlington, and Quincy, lines serve this area directly. These roads in turn make connections with the Gulf, Mobile, and Ohio; Louisville and Nashville; Southern; and Cleveland, Cincinnati, Chicago, and St. Louis lines all within the boundaries of Southern Illinois. Admirable cooperation between the various railroads facilitates the interchange of haulage and rolling stock with a minimum of difficulty.

Fast overnight freight service is maintained to Chicago, and it takes only a few hours to haul coal to St. Louis. This rapid thru service to these large distributing centers is a distinct marketing advantage.

The highway net of Southern Illinois in general, and Williamson and Franklin counties in particular, is dense, and offers excellent opportunities for movement of coal to market by truck. (Fig. 5) Illinois routes 37, 13, 149, and 148 are among the most

important routes which traverse the two counties. These routes connect with important roads outside the area, and connections with St. Louis and Chicago are especially good.<sup>9</sup> All of the more important roads are surfaced with concrete and asphalt, the majority of them with concrete. Route 37 which passes thru the two counties and then on to Chicago is one of the most travelled roads in the entire state.

Water transportation is not widely used, but small amounts of coal move to Chicago via a combination rail and Illinois Waterway haul. Small amounts of coal move down the Mississippi River to southern states and overseas destinations. There are minor opportunities for an increased use of the Ohio and Wabash Rivers, but it is doubtful if either of these water ways are ever used extensively.

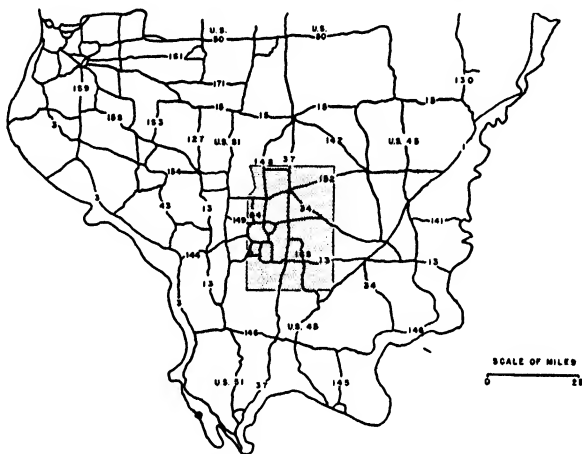


FIG. 5. Map showing highway net of Southern Illinois (Shaded area indicates Williamson and Franklin Counties.)

### FUTURE

Undoubtedly coal will continue to play a very important part in the economy and life of Williamson and Franklin counties. Only a small fraction of the coal has been removed from beneath the surface of this area. Mining can undoubtedly continue for 200 years or more, even at accelerated rates of production.

This area seems destined to become increasingly important. With the rapid depletion of oil and natural gas it seems highly probable that an increased use of coal and oil shale is forthcoming.

During the war and the post war boom tremendous amounts of high grade coking coals have been used. This valuable coal has

<sup>9</sup> Reed, F. H., Jackman, H. W., Rees, O. W., Yohe, G. R., and Henline, P. W., "Use of Illinois Coal for the Production of Metallurgical Coke," Bulletin No. 71, Ill. State Geol. Sur., Urbana, Illinois, 1947, p. 29 and Personal Communications from Mr. H. H. Taylor, Pres. of Franklin County Coal Corp., and Mr. Fred S. Wilkey, Secretary of the Ill. Coal Operators Assoc.

become seriously depleted in some areas. Altho the coals of Williamson and Franklin counties is of lower rank than coal used for making metallurgical coke, it can be mixed in small percentages to produce a satisfactory reducing coke. Coke mixes containing from 10 per cent to 30 per cent of Southern Illinois coals are being successfully utilized in the Chicago area iron and steel industries.<sup>10</sup> Satisfactory domestic coke has been produced at West Frankfort since 1934, but the plant has been closed this year because of competition from Texas natural gas.

Modernization and mechanization seem to be the watchword in the coal industry of Williamson and Franklin counties. It is not inconceivable that this area will become the most modern coal mining center in the United States.

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## VALUES AND PROBLEMS IN THE USE OF COLOR TRANSPARENCIES WITH A SOURCE LIST OF COLOR TRANSPARENCIES

ELIZABETH EISELEN

Wellesley College

Visual aids, whether in the form of maps or charts, illustrations in books or magazines, movies or slides are an accepted tool in the teaching of geography. With development of color photography, pictorial aids have added the color movie and color transparency (Kodachrome or Ansco color slides) to the widely used black and white movie and black and white or tinted slide. Analysis of values and problems in the use of color transparencies must be made in relation to rival forms of pictorial aids. Many teachers express a preference for the movie type of visual interpretation; some particularly like its attention-getting quality. On the other side of the argument, however, is the fact that while showing movies it is impossible for the teacher to talk at length about a specific view. Controversy as to the relative merits of movies and slides seems resolved if we recognize that slides are better than movies to hold pictures for discussion, but movies are better to show action. Thus both should have a place as teaching aids. In comparison with both movie and strip-film, slides permit greater flexibility of use.

When it comes to color transparencies as opposed to black and

<sup>10</sup> Ibid.

white slides, the feeling seems to be growing in favor of the use of color because color is an essential element of landscape. Most geographers who use color transparencies believe that color helps the student understand the geographical phenomena being taught and that it aids in retention of knowledge gained from the slides. Many subjects such as soil profiles, rocks and minerals, and details of foliage have more meaning when in color, and color is better for making comparisons or for emphasizing contrasts. Even in slides of charts, diagrams, and maps, color may be effectively employed for emphasis.

The complaint has been made that color distracts or overemphasizes unimportant items such as sky and water. This possibly should not be classified as argument against the use of color slides but rather as a challenge to the skill of the teacher in directing the student's attention to pertinent details.

Altho more and more geographers are turning to the use of color transparencies, they are not without criticism of the quality of color slides and are aware of problems related to their use. Many of the objections to the use of color transparencies are technical details which should be subject to remedy with further experimentation on the part of film manufacturers, particularly in the field of duplication of original slides, the acquisition of greater skill on the part of color photographers, and the purchase of better projection equipment.

Belief in the use of color transparencies and their actual use, however, are not necessarily synonymous. Lack of equipment in many schools is a problem, and the poor quality of available slides is a discouraging factor. If color transparencies do have value in geographic teaching, as the replies to the questionnaire on color transparencies sent out in 1948 by the National Council of Geography Teachers would seem to indicate, this fact should not only be publicized, but the belief should be justified thru demand for improvement of commercial slides. Many geographers take their own pictures, but few can travel extensively enough to satisfy all their needs. Even the photographer turns to commercial sources to supplement his own pictures. There, however, he often finds the quality of slides poor and the subject range inadequate with some geographic areas completely ignored. Many available slides are purely "travelogue" material, emphasizing the unique or scenic. As one geographer expressed the problem, "Many slides are not good

illustrations of the subject being taught. Good geography pictures should be taken by a trained geographer and geology pictures by a geologist. One person cannot be a judge of good pictures in all fields of learning."

In addition to poor choice of subject matter, most commercial firms supply only meager information as to the subject itself, to say nothing of their failure to give such pertinent facts as exact location of the scene and season when taken.

Another criticism has been the lack of slide sets developed as units of study. Many geographers emphasize the need for sequences on various economic activities, natural phenomena, and regions.

Possibly the many problems which have been cited seem to outweigh the values of color transparencies. Therefore it is worthwhile to note that progress is being made in all phases of their use from improved projection equipment to better geographic slides. Investigation has revealed that individual geographers, educational agencies, government bureaus, and a few commercial firms are attacking the problem of useable and useful slides. This, however, is only a beginning as examination of the appended list of available color transparencies will reveal.

Solution to the problem of acquiring good slides has not been reached. Certainly one solution is for the individual to take up color photography. One geographer advocates this so strongly that he wrote in reply to the questionnaire, "Equipment is so small in cost that no person should be permitted to be a geography teacher who does not have his own camera and projector and screen." Nevertheless from those whose travel opportunities are limited and especially from those who teach the geography of foreign lands, there will continue to be demand for commercial pictures. For their benefit a list of organizations from which slides may be purchased or borrowed is appended. It is hoped the list will be helpful, altho it will point up the inadequacy of present sources. It includes every source the author has been able to locate of color transparencies which might fit into courses taught by geographers, altho from many of the agencies only a small number of slides have geographic value. Many of the companies were suggested by geographers who have purchased slides from them. Additional names will be welcomed.

It would seem from talking to geographers and from the response to the 1948 questionnaire of the National Council of Geogra-

phy Teachers that color transparencies are finding an increasingly valuable place in the teaching of geography, not to the exclusion of other visual aids but as a worthy addition to them. To quote an article in the *Boston Sunday Herald* of October 31, 1948, "Color is not merely the coming thing in photography. Color is here." However, it seems wise to close with the reminder given by one geographer that "showing pictures is one thing, and real use of pictures as teaching aids where they are the best medium is another."

#### SOURCE LIST OF COLOR TRANSPARENCIES

##### *I. Available for Purchase*

Allen's Photo Studio, 2715 Beverly Drive, Gary, Ind.

A few slides of a geographic nature, especially of Bavaria.

American Council on Education, 744 Jackson Place, Washington 6, D.C.

Slide sets on Latin America. Many are of a geographic nature. Each set is accompanied by teacher's notes, including background material and comments on each slide. See also listing under slides available on loan.

Best's Studio, Yosemite National Park, Calif.

U.S. National Parks.

Calichrome Slide Agency, 460 W. Longden Ave., Arcadia, Calif.

California plant life, including plant ecology.

*Coronet Magazine* Color Features.

Sets available from Society for Visual Education, Inc., 100 E. Ohio St., Chicago 11, Ill. Produced from the Color Features which have appeared in *Coronet* since August, 1946. Paricutin, Mississippi River, etc.

Crandall Studios, Moran, Wyo.

U.S. National Parks.

Denoyer-Geppert Co., 5235-5237 Ravenswood Ave., Chicago 40, Ill.

Map slides in color of each state of the United States, the continents, a few regions and countries, the world. All physical-political except world map which is political.

Diemer, M. E., 325 N. Randall Ave., Madison 5, Wis.

United States, Canada, Guatemala, Cuba, Mexico City, etc. Emphasis on "scenic, educational, and scientific subjects." May be purchased as sets of 25 or as single or assorted slides.

Educators Visual-Aid Service, 1706 South Blvd., Ann Arbor, Mich.

Three basic geology slide sets: General Geology (100 slides), Historical Geology (50 slides), Rock Textures and Mineral Properties (30 slides). Data brochure with each set.

Elk Studio, Elkton, Md.

Miscellaneous subjects in North and South America, the Caribbean Islands, and Hawaii.

Geographical Kodachrome Service, 200 E. Irvin Ave., State College, Pa.

North America. Individual slides classified according to subject emphasis, i.e. agriculture, physiography, soils, etc.

Graves, C. Edward, P.O. Box 88, Carmel, Calif.

Sets on the National Parks. Descriptive cards.

Haynes, Inc., 801 N. Wallace Ave., Bozeman, Mont.

Yellowstone National Park.

Heald-Robinson, 2202 N. Santa Anita Ave., Altadena, Calif.

Geologic features and scenic attractions in the United States.

Instructional Films, Inc., 330 W. 42nd St., New York 18, N.Y.

Soon to be released: United States Geo-Historic Map Slides (46 slides). Of special interest in the field of historical geography. From original maps drawn for the set. In color.

John Wiley and Sons, 440 Fourth Ave., New York 16, N.Y.

Under preparation, a set of visual aids including approximately 300 slides for a forthcoming textbook on physical geography. Has a set of approximately 250 color transparencies to supplement Longwell, Knopf, and Flint, *Physical Geology*.

Kime Kolor Pictures, 121 E. Foothill Blvd., Altadena, Calif. or American Film Registry, 28 E. Jackson Blvd., Chicago 4, Ill.

North America, South America, Europe, Asia, Africa. Teacher's guides for the South and Central American sets. May be purchased individually, in sets, or in groups.

Kodak Hawaii, Ltd., 1065 Kapiolani Blvd., P.O. Box 1260, Honolulu 7, Hawaii.  
Hawaii.

Larue Sorenson Studio, P.O. Box 1304, Carmel, Calif.

Mexico. Prepared originally for use in the California public schools. Grouped into broad educational units. Descriptive text.

Martin's Kodachrome Teaching Units, distributed by Eau Claire Book and Stationery Co., Eau Claire, Wis.

Units on Geography of Wisconsin (8 units) and History of Wisconsin (4 units). May be purchased as separate units. Study guide with each unit.

Medo Photo Supply Corporation, 15 W. 47th St., New York 19, N.Y.

Slides "feature places of geographic and historic interest also the manners and costumes of people in many countries."

Meston, Harvey, P.O. Box 3155, El Paso, Texas.

United States (emphasis on National Parks and Monuments, scenic points of interest), Canada, Cuba, Mexico. Sets of 8 slides.

Morgan, William L., P.O. Box 174, Monterey, Calif.

California and miscellaneous subjects in the Southwest and China.

Munday and Collins, 39 Edgewood Rd., Redwood City, Calif.

Sets on a variety of subjects including geographic and geologic subjects.

Nesbit, Paul W., 1622 N. 16th St., Phoenix, Ariz.

Wide variety of geographic subjects, especially of the Rocky Mountain states.

Nichols, Tad, Route 6, Box 685, Tucson, Ariz.

Set of 10 slides of Paricutin. Slides of the Southwest.

Philp Photo Visual Service, 1218 American Ave., Long Beach 13, Calif.

Sets on "people, places, industries" in the United States, Canada, Alaska, China, India. Script with each set. Individual slides may be selected.

Projection Slide Co., 210 Commercial Bldg., San Jose 15, Calif.

California: scenic, historical, botanical, industrial.

Radex Stereo Co., 111 N. La Brea Ave., Los Angeles 36, Calif.

Primarily the United States. Sets with text cards. Also available as stereo pairs.

Reed, Harry, Moab, Utah.

U.S. National Parks.

Ro-Loc, Box 1715, Washington 13, D.C.

United States, Canada, Philippine Islands, Caribbean Islands, Central America, Middle East. Individual slides and slide groups.

Society for Visual Education, Inc., 100 E. Ohio St., Chicago 11, Ill.

Huge collection on a wide variety of subjects and regions. Some of the slides have been organized into units with brief instructional guides, but the majority have not been assembled in sets and do not have accompanying information other than brief title. Also available from representatives such as the Stanley Bowmar Co., 513 W. 166th St., New York 32, N.Y.

Soil Science Society of America.

Under preparation, set of slides of soil profiles and landscapes. When available will probably be handled by a commercial firm.

Stillfilm, Inc., 8443 Melrose Ave., Hollywood 46, Calif.

Series of color slides on rocks, coal veins, ores, etc.

Teaching Aids Exchange, P.O. Box 1127, Modesto, Calif.

Black and white outline maps (either with or without names) of each state of the United States, continents, various regions and countries, world. Will make slides in color or black and white of your own maps, drawings, and charts.

U.S. Department of Agriculture, Soil Conservation Service.

See listing under slides available on loan.

Utah Parks Co., Cedar City, Utah.

U.S. National Parks.

Ward's Natural Science Establishment, P.O. Box 24, Beechwood Station, Rochester 9, N.Y.

Rocks and minerals.

Wesco Color Slides, The Standefer Co., 690 Market St., San Francisco 4, Calif. Also available at many camera stores.

United States, Alaska, Hawaii, Guatemala, Mexico. Individual slides and some sets.

West-View Kodachromes, 1523 Montana Ave., Santa Monica, Calif.

Western States. Individual slides and a few sets of 18 slides each.

Wilner Film and Slides, P.O. Box 231, Cathedral Station, New York 25, N.Y.

The Story of Gems. Single slides, groups of slides, or a complete set of 125 slides.

Lecture manual.

## *II. Available on Loan or Deposit*

American Council on Education, 744 Jackson Pl., Washington 6, D.C.

Slide sets on Latin America. See listing under slides available for purchase. Available on loan from regional depositories in cooperation with the Pan American Union, Washington 6, D.C.

Standard Oil Company of New Jersey, Educational Service, Room 1626, 30 Rockefeller Plaza, New York 20, N.Y.

Oil: An American Industry. A selection of 21 documentary paintings reproduced on color transparencies.

U.S. Department of Agriculture, Forest Service.

Some State or Regional Foresters have slides available. If you wish the name of the Forester in your state or region, write the Forest Service, Washington 25, D.C.

——, Soil Conservation Service, Visual Information Section, Room 5106, South Bldg., 12th and Independence S.W., Washington 25, D.C.

A file of original color transparencies is maintained. A subject file of duplicates is available for public use from which selections can be made to compile slide sets on specific subjects. Duplicate slides, with legend cards, will be furnished on loan for teaching and lecturing purposes free of charge.

A general set of some 40 slides on soil and water conservation has been selected with suggested lecture notes for distribution to teachers on indefinite loan.

A special slide set and lecture notes titled "Conquest of the Land through Seven Thousand Years" prepared by Dr. Walter C. Lowdermilk, is now available in

duplicate sets at cost. There are also several hundred original slides on file of Dr. Lowdermilk's work in China, of which duplicates may be had.

Visual Aids Libraries in city school systems, colleges and universities, museums, and libraries.

West Coast Lumbermen's Assoc., 1410 S.W. Morrison St., Portland 5, Ore.

Sets: Fighting Fire in West Coast Woods, Harvesting Trees in West Coast Forests, How West Coast Forest Trees Grow (planned). About 35 slides in each set. Teacher's manual with each. Available on loan to Oregon and Washington public schools. Others should request information regarding availability.

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## THE RELATIONSHIP BETWEEN THE WORK OF ELEMENTARY SCIENCE AND GEOGRAPHY TEACHERS\*

GEORGE G. MALLINSON

Western Michigan College of Education, Kalamazoo, Michigan

During the past three decades there have been concerted efforts on the part of educators to develop learning experiences around broader and broader areas of subject-matter. There is considerable evidence to show that such efforts are justified. Children neither learn nor retain facts in isolation, but rather learn and retain those learning experiences which are developed about generalizations and principles.

In accord with this evidence a number of curricular changes have taken place both at the secondary-school level and at the elementary-school level. At the secondary-school level these changes are notable in the area of the sciences. Meteorology, Physiography, and Physiology among others have evolved into the more generalized subject-matter area known as General Science. Botany and Zoology have given way to General Biology. In the near future it may be expected that Physics and Chemistry will be replaced by General Physical Science.

It must be emphasized that such generalization does not mean simplification or dilution. Rather, learning experiences are being combined into more meaningful groups. This same trend has been noted also in the elementary school. The learning experiences at this level, instead of being developed about reading, writing and arithmetic are being developed about areas or cores such as transportation, the grocery store, and the city.

\* Presented at the Cleveland meeting of the National Council of Geography Teachers, November, 1949.

It is not the purpose of this paper to evaluate the arguments of critics of this newer procedure. However, it is common knowledge that the efforts to develop the so-called common learnings, correlation, integration or cores have been at times somewhat naive. In many educational circles the core or common learnings plan has become almost a religion. There seems to be an insensate desire to combine areas of learning with other areas of learning whether or not such combinations make sense. It can also be stated that the necessary sequential development of many skills has been disregarded.

There is one fundamental principle which has been ignored by both the proponents and critics of the common learnings program. If certain learning activities fit together in a broader learning experience, the integration of such learning activities is highly desirable. If such activities cannot be synthesized readily, then integration is highly undesirable.

The hypothesis of this paper is that many, altho not all, of the learning activities considered to be part of elementary geography are very similar to the learning activities in elementary science. Therefore where such similarities exist it is extremely desirable that integration be made. An attempt will be made therefore to provide evidence to support this hypothesis. There are two limitations in providing this evidence:

1. The time allotted for the presentation negates any extensive treatment.
2. The local teaching situation will, in certain circumstances, govern the type of learning activities.

The procedures used in this paper to support the hypothesis will be thru the textbook. It is superfluous to comment extensively on the influence of the textbook on the content of courses. Further it is common knowledge that textbooks are written after thoro investigation concerning the topics which are deemed desirable for the courses for which they are written. Therefore, if it can be shown that the content of textbooks for elementary geography deal with many of the same areas as do textbooks in elementary geography, then it is justifiable to assume that these areas may well be integrated with respect to teaching geography and science.

For this purpose were selected the fourth-, fifth- and sixth-grade textbooks for elementary geography of three book publishers, and the textbooks for elementary science prepared by these same pub-

TABLE I. AREAS OF SUBJECT-MATTER FOUND IN TEXTBOOKS FOR  
ELEMENTARY SCIENCE AND ELEMENTARY GEOGRAPHY

Major Areas	Topics in Textbooks for Elementary Geography	Topics in Textbooks for Elementary Science
Agriculture	<p>Products produced by and living conditions on</p> <ol style="list-style-type: none"> <li>Dairy farms</li> <li>Fruit farms</li> <li>Ranches</li> <li>Grain farms</li> </ol> <p>Plants which grow in different temperature belts</p> <p>Life in the chief farming regions of the world</p>	<p>Conservation of soil</p> <p>Soil for gardens</p> <p>Plants and soil formation</p> <p>Erosion of topsoil</p> <p>Overplanting and over-grazing</p> <p>Preparation of soil for planting</p> <p>Types of soil</p> <p>Plants need soil for growth</p>
Air	<p>Nature and Characteristics</p> <p>The heating and cooling of the air</p> <p>Temperature of the air in different parts of the world</p> <p>Moisture in the air</p> <p>Pressure of the air</p> <p>Movements of the air</p> <p>Rainfall of the world</p> <p>Different types of climates</p> <p>Special storms</p> <p>Weather forecasting</p>	<p>Nature and Characteristics</p> <p>Heating and cooling of the air</p> <p>Temperature zones on the earth</p> <p>Water vapor in the air</p> <p>Pressure of the air</p> <p>What makes the wind blow</p> <p>Effects of rain on soil</p> <p>Climates of different places on the earth</p> <p>Electrical storms</p> <p>Records of weather</p> <p>Living things must have air</p>
The Earth as a Planet	<p>The solar system</p> <ol style="list-style-type: none"> <li>Planets</li> <li>Meteors</li> <li>Satellites</li> </ol> <p>The earth—its size and motions</p> <p>Seasons and zones</p> <p>Latitude and longitude</p> <p>Map projections</p> <p>The moon and tides</p>	<p>The earth as a planet</p> <p>Rotation and revolution</p> <p>Day and night</p> <p>The seasons and zones</p> <p>The force of gravity</p> <p>The geosphere, troposphere and atmosphere</p> <p>The relationship of the sun to the solar system</p>
Forests and Timbering	<p>Life in tropical forests</p> <p>Life in temperate forests</p> <p>Great forests of the world</p> <p>The forested lands</p> <p>Products of the forests</p> <p>Conservation of the forests</p> <p>The growth of trees</p> <p>Forests of the United States</p>	<p>Tropical rain forests</p> <p>Forests in cold climates</p> <p>Destruction of forests by men</p> <p>Conservation of forests</p> <p>Forests help save the soil</p>
The Life of Fishermen	<p>The great fishing grounds</p> <p>The cod fisheries</p> <p>Herring and sardine fisheries</p> <p>Shore fisheries</p> <p>Whaling and sealing</p> <p>Fishing in warm water</p>	<p>Migration of fish</p> <p>Fish as a source of food</p> <p>Different kinds of fish</p> <p>Fish ladders</p> <p>Warm water and cold water fish</p> <p>Deep sea fish</p>

TABLE I. (continued)

Major Areas	Topics in Textbooks for Elementary Geography	Topics in Textbooks for Elementary Science
Mines and Mining	Miners and mines Iron and its uses Tin and its uses Copper and its uses Lead, zinc and aluminum The precious metals Precious stones The fuels found in the ground Valuable mineral salts	Characteristics of mines Minerals in the ground Use of metals in industry Fuels from the ground Energy from fuels
Trade and Transportation	The necessity for trade Simple means of transportation on land Transportation on rivers and canals Ocean transportation Roads and highways Railroads and airways	The use of steam in transportation The use of electricity in transportation Move goods from place to place Manufacture of railroad rails Travel by air

lishers for the same grade levels. All of the textbooks were examined carefully to determine the major areas with which they dealt. A list was then made of the major areas which were found in both the elementary geography and in the elementary science series. Then the various topics found in the textbooks for elementary geography were listed under the heading of their major areas. This process was repeated for the textbooks in elementary science. The data was then tabulated. No effort was made to take cognizance of the grade placement of the areas, nor was an effort made to include all of the similar areas found in the textbooks.

Table I indicates the major areas (in alphabetical order) discussed in the various textbooks in elementary science and elementary geography, together with the topics included under them.

### CONCLUSIONS

An examination of the data compiled in Table I indicates that many of the major areas in textbooks for both elementary science and elementary geography are very similar, and also that the topics used in developing these areas are very similar. There is, in certain cases, extreme similarity in order of the topics and in the manner in which the topics are treated and illustrated. This is especially true in the major areas which deal with the solar system, and with

air. This information, however, is not expressed directly in the table.

The table also indicates that many of the major areas found in both types of textbooks are developed with different topics. An examination of some of these areas, namely, the one dealing with the life of fishermen, would indicate that the topics found in the textbooks for elementary geography could be integrated feasibly with those found in textbooks for elementary science or vice versa.

It must be stated also that some of the major areas found in the textbooks for elementary geography were not matched by similar areas in textbooks for elementary science. In such cases, it is unlikely that attempts to fuse or integrate such materials would prove desirable.

In summary it may be stated defensibly that some of the areas ordinarily covered in elementary geography may be integrated feasibly with areas ordinarily covered in elementary science. This conclusion, however, would not apply to all of the areas ordinarily covered in these two fields.

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## EDITORIAL NOTES AND NEWS

Do you know that copies of the last four Professional Papers are still available? Two of these, No. 6, *Standards of Certification for the Teaching of Geography in High Schools*, and No. 7, *College Geography and Its Relation to Teacher Training in Secondary School Geography*, sell for 25 cents each. The last two Professional Papers, No. 8, *Geography in Undergraduate College Curricula*, and No. 9, *Geography and World Understanding*, are 50 cents each. If you wish copies, write to Miss M. Melvina Svec, Secretary, National Council of Geography Teachers, State Teachers College, Oswego, New York.

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The Committee on Field Experiences and Travel for Teachers, headed by Dr. Pauline P. Schwartz, has compiled and mimeographed a partial list of field courses offered by departments of geography during the spring and summer of 1950. If you wish a copy, address your request to our president, Dr. Loyal Durand, Jr., University of Tennessee, Knoxville. If you know of a field course offered by a geography department which is not included in the list, will you please send the name of the director to Dr. Schwartz, State Teachers College, New Haven, Connecticut.

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According to Professor Printz, Oslo University, the principal commercial substances to be obtained by Norway's seaweed industry are algin, iodine, fertilizers, and other chemical substances. Plans are underway to make seaweed gathering and processing one of the most important industries in Norway. Two factors favoring such an industry are a long, indented coastline and the availability of large amounts of relatively cheap hydro-electric power.

## INTEREST-STIMULATING DEVICE

### THE OCEANS' TWENTY PRODUCTS

Many items other than fish flesh for food are obtained from sea water or sea life, either plant or animal. From what are the following obtained wholly or in part? Be definite—indicating whether it is a plant, animal, fish or the water itself from which the raw material comes.

1. Agar \_\_\_\_\_
2. Buttons \_\_\_\_\_
3. Caviar \_\_\_\_\_
4. Coral \_\_\_\_\_
5. Fertilizer \_\_\_\_\_
6. Furs \_\_\_\_\_
7. Iodine \_\_\_\_\_
8. Isinglass \_\_\_\_\_
9. Leather \_\_\_\_\_
10. Lime \_\_\_\_\_
11. Magnesium \_\_\_\_\_
12. Pearls \_\_\_\_\_
13. Perfume \_\_\_\_\_
14. Potash \_\_\_\_\_
15. Salt \_\_\_\_\_
16. Soap \_\_\_\_\_
17. Spermaciti \_\_\_\_\_
18. Sperm oil \_\_\_\_\_
19. Sponges \_\_\_\_\_
20. Vitamin D \_\_\_\_\_

## THE NATIONAL COUNCIL AT WORK

The 1950 annual meeting of the National Council of Geography Teachers will be held at the Edgewater Beach Hotel in Chicago on Friday and Saturday, November 24 and 25. The meeting will be a parallel one with the Central Association of Science and Mathematics Teachers, and the National Council will help the Geography Section of the Central Association celebrate its fiftieth anniversary. The National Council banquet on Friday evening will be addressed by Mr. George T. H. Kimble, the new director of the American Geographical Society of New York, and formerly the head of the Department of Geography at McGill University, Montreal.

The Executive Board of the National Council of Geography Teachers met at Worcester, Massachusetts, on Thursday, April 6. Some twenty-seven items of business, all of which had arisen since the meetings at Cleveland, were transacted.

Two additional appointees to the *Committee on Standards of Teacher Preparation and Certification* (see March, 1950, *Journal*) are Professors Clyde Kohn of Northwestern University and Veva K. Dean of the State Teachers College, East Stroudsburg, Pennsylvania.

Two official delegates will represent the National Council at the Conference of Leaders in Elementary Education to be conducted by the United States Office of Education at Washington, D.C. on May 22, 23, and 24. Professor Norman Carls of American University, who attended last year's Conference will again represent us; the other official delegate will be announced later. In addition many Council members will be in attendance, as well as Miss Halene Hatcher, Geography Specialist in the Office of Education.

The undersigned, as 1950 President, attended several meetings, at two separate times, in Washington in connection with the recommendation of the United States delegates to the UNESCO Seminar on the Teaching of Geography to be held on the McGill University campus in Montreal from July 12 to August 23. The names of the official American delegation will be announced by the UNESCO Relations Office of the Department of State of the United States government. The Seminar topic of study is "How can the teaching of geography in its various branches—physical geography, economic geography, human geography—be used as a means of developing international understanding?"

Mrs. Erna Grassmuck Gilland of California, Pennsylvania, will be the official delegate of the National Council at the world meeting of the World Order of the Teaching Profession at Ottawa, Canada, July 17 to 23.

John H. Garland of the University of Illinois, treasurer of the National Council, submitted a detailed audited report to the Executive Board at its April 6 meeting. The report covers the last fiscal year, February 1, 1949 to January 31, 1950. A summary of operations follows:

	Total all Funds	Publications Fund	General Fund	Research Fund
Cash Balance 2/1/49	\$ 7,911.25	\$ 754.00	\$1,076.94	\$6,080.31
Add Receipts for year	3,496.84	356.00	2,006.95	1,133.89
Total funds	11,408.09	1,110.00	3,083.89	7,214.20
Less Disbursements	2,076.85	180.16	1,866.69	30.00
Cash Balance 1/31/50	\$9,331.24	\$ 929.84	\$1,217.20	\$7,184.20

LOYAL DURAND, JR., *President*

## EDITORIAL NOTES AND NEWS

Among the government parks and monuments ranking high in popularity are Hoover Dam and Lake Mead. During 1949, about one and a half million people visited the area.

A School of Conservation is being established at Yale University. Dr. Paul B. Sears, who will direct the work, will also give two fundamental courses in general ecology and the ecological basis of human society. This, the first School of Conservation in the United States, will provide a two-year graduate course leading to the unique degree of Master of Science in Conservation.

Have you seen a copy of "Forests and National Prosperity?" During 1945 and 1946, the Forest Service made a reappraisal of the forest situation in the United States. This report brings together in concise form the over-all findings of the reappraisal and restates the principal Federal measures which are believed to be necessary to assure ample timber supplies for the future. Printed in 1948, the booklet contains 99 pages with illustrations.

Have you examined a copy of "Conservation Journeys for Iowa Boys and Girls" prepared by Alison E. Aitchison, Professor of Geography, Iowa State Teachers College as one of the Educational Service Publications? Copies may be had from the Bureau of Extension Service, Iowa State Teachers College, Cedar Falls for 20 cents. This excellent teaching aid recalls another written recently by Professor Aitchison entitled, "The Use of Globes and Maps," which may be obtained from the same place.

Members of the Geography Club, Southeastern Pennsylvania elected the following officers for 1950: President, Dr. Alvin S. Keinard, Department of Geography, State Teachers College, West Chester; Vice-president, William J. Wunsche, Department of Geography, Ridley Park High School; Secretary, Jean Mesner, Supervisor of Elementary Reading, Norristown; and Treasurer, Viola Hawk, Teacher, Cochranville School. The last program, held at the West Chester Teachers College, was an illustrated lecture on the conservation program of the Brandywine Valley Association followed by a field trip under the direction of Dr. Keinard. During the field trip, local points of physiographic interest were visited and evaluated from the standpoint of visitation suitability for different age groups.

"Historical Statistics of the United States," recently issued by the Census Bureau, records the flow of immigrants from all countries by each year for one hundred and twenty-five years to feed the "melting pot" of the United States.

Have you seen the NCGT Travel Kit? Have arrangements been made to show the Travel Kit at your next state council or association meeting?

The California Council of Geography Teachers will hold its Spring Meeting May 6 and 7, 1950 at Stanford University. The Friday morning theme will be the teaching of geography, and the afternoon will be devoted to general geography. The formal address will be Saturday noon, and a half-day field trip is scheduled for Sunday morning. Professor V. Calvin McKim, State Coordinator for California, in behalf of the California Council, extends a cordial invitation to any N.C.G.T. member or geographer.

Eight chapters of Gamma Theta Upsilon were organized during 1949. Universities with chapters and their sponsors are: North Texas State Teachers College, Robert A. Miller; Tennessee Agricultural and Industrial College, James K. Anthony; Western Michigan College of Education, Cyril L. Stout; University of Miami, Miami, Florida,

J. Riley Staats; University of Utah, Elbert Miller; Teachers College, Columbia University, George T. Renner; Nebraska State Teachers College, Chadron, Alvin M. Johnson; and The State College of Washington, William H. Wake III.

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Since 1940 according to *Steel Facts*, steel capacity has risen nearly 22 per cent, as compared with an increase of approximately 15 per cent in population of the continental United States. Since the beginning of the century, steel capacity has been more than quadrupled. Steel capacity per capita of population, now over 1,300 pounds, is at a peacetime record and more than twice as great as early in the century.

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The Association of Pacific Coast Geographers will hold its next meeting June 19 to 24 at Salt Lake City.

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One of the most recent organizations to associate with the National Council of Geography Teachers is Alpha Omega Gamma, a local geography fraternity, State Teachers College, Indiana, Pennsylvania. Stanley Mrak represented the fraternity at the Cleveland meeting. Norak Zink is sponsor.

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DR. J. GRANVILLE JENSEN reports that a Second Annual Institute of Northwest Resources will be held on the Oregon State College campus, Corvallis, June 19-30, 1950. The two-week institute will feature some twenty outstanding authorities on Northwest regional resources, development, and utilization.

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The remains of what is believed to be the first successful iron blast furnace in North America at Saugas, Massachusetts is being uncovered. A photograph of the site appears in the February, 1950 issue of *Steel Facts*.

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Have you examined *Weatherwatch*, a monthly weather summary, prepared by Franklin Institute, Philadelphia 3, Pennsylvania?

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The population in the United States, according to Census Bureau estimates, reached 150,604,000 on January 1, 1950.

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In 1948 three volumes, 623 pages, of abstracts on geographic publications appearing in Germany during the years 1939-1946 were published. If you are interested, write to the Office of the Publication Board, Department of Commerce, Washington 25, D.C. The volumes are entitled, "First Review of German Science, 1939-1946."

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Various phases of North Dakota geography which should be very useful to classroom teachers appeared in a recent bulletin of the Association of North Dakota Geographers. Interested persons might write to Miss Viola M. Bohn, 110½ Avenue "C", Bismarck, North Dakota, for a copy.

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A China Institute of the Midwest will be held July 17-29, 1950 on the campus of the Ball State Teachers College, Muncie, Indiana. It is to be held under the auspices of the China Institute of America and is sponsored by the Ball State Faculty Committee on International Relations of which Dr. Floy Hurlbut, geographer, is chairman.

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Have you read "Ways of Evaluating College Teaching" in the February 4, 1950 issue of *School and Society*?

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In 1940 about 23 per cent of the American people lived on farms. By 1960, says a Twentieth Century Fund survey, farm population will shrink to about 18 per cent.

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According to a Twentieth Century Fund survey, population in the United States grew most rapidly after the Civil War; it multiplied nearly threefold between 1860 and 1910.

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Have you read Offerings and Registrations in Social Studies by Howard R. Anderson in the February, 1950 issue of *Social Education*?

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Did you know that the theme of a presidential address before the Association of American Geographers was educational geography? In December, 1915, Professor Richard Elwood Dodge for his presidential address read a paper on "Some Problems in Geographic Education With Special Reference to Secondary Schools." This is printed on pages 3-18, Volume 6, Annals of the Association of American Geographers. Was Professor Dodge right in his evaluation of the situation and the future?

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Have you seen the 1949 directory of 16 mm film libraries serving schools, colleges, and community organizations thruout the United States issued by the Office of Education, Federal Security Agency. Copies of this directory, Office of Education, Bulletin No. 10, 1949 are available from the Superintendent of Documents, Government Printing Office, Washington, D.C., 15 cents each.

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According to Lord Boyd Orr, the world needs today just about double the amount of food that is available.

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Steel capacity in the United States now closely approaches one hundred million tons a year. During 1949, the annual potential was increased by 3,271,870 tons. With an annual potential of 99,392,800 net tons of ingots and steel for castings, the output from steel making furnaces, operated at capacity for one year, would now be about 11 million tons more than the steel made last year in all the rest of the world combined.

## GEOGRAPHICAL PUBLICATIONS

**Andrew Hill Clark. *The Invasion of New Zealand by People, Plants and Animals*. 465 pages and 81 figures. Rutgers University Press, 1949. \$6.00.**

This book is a report of a revolutionary change in the character of a region, which occurred within a period of less than two centuries. One of the most important factors in this change was the invasion of the area by plants and animals, which, with the help of man, mingled with or displaced the native biotic life.

Dr. Clark has blended the geography and history of South Island in a unique manner. He first surveys the physical scene before the invasion, then the introduction of the people, finally the changes in land use and plant and animal life that resulted from the invasion. It is an interesting approach to historical geography and it is well done.

The book contains a mass of detail that has been gleaned from various published sources as well as the personal observations of the author. There are 81 illustrations, many of them well drawn maps that portray some aspect of the geography or history of South Island. Explanatory footnotes are placed at the bottom of the page for easy use, but the 578 reference citations are arranged by chapters at the end of the text. A two page evaluation of sources of statistical data, a 22 page bibliography, and a 13 page index complete the book.

ALDEN CUTSHALL

*Chicago Undergraduate Division  
University of Illinois*

**Trans World Airlines (Prepared by G. Etzel Percy) *Invitation to Italy*, Booklet No. 4, New York, New York, 77 pages.**

This is a desirable type of publication designed for tourists which teachers and students will find very valuable. Dr. Percy knows the region from personal experience and describes selected areas in an interesting style.

**Galbraith, J. K., *America and Western Europe*, The Foreign Policy Association, 22 East 38th Street, New York 16, New York, Public Affairs Pamphlet No. 159, 32 pages. 20¢.**

Another of the excellent pamphlets issued by the Foreign Policy Association. This deals with some of the post war problems and international trade, and suggests some of the things that may be done to improve world conditions.

**Cumberland, Kenneth B., *Whitcombe's New Zealand in Outline*, Whitcombe and Tombs Ltd., Christchurch, New Zealand, 1949, 8/3d, 84 pages, 120 figures.**

This is a pictorial geography of New Zealand and will be welcomed by American teachers. The illustrations are excellent and the text provides an abundance of data and valuable interpretations.

**Ouren, Tore and Axel Sømme, *Trends in Inter-War Trade and Shipping*, J. W. Eides Forlag, Bergen, Norway, 1948, 58 pages, 10 tables, 25 figures.**

An atlas with interpretive text of inter-war trade as viewed by Norwegians. Maps of exports and imports for a great variety of products are shown for the world and leading countries.

# The JOURNAL of GEOGRAPHY

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VOLUME XLIX

SEPTEMBER, 1950

NUMBER 6

## CONSERVATION—AN IMMEDIATE CONCERN TO ALL NATIONS

HALENE HATCHER

United States Office of Education

As never before, nations the world over are considering conservation a matter of recognized necessity to each individual, an issue of vital concern to all peoples, and potentially a "major basis of peace." Indicative of this unprecedented world-wide interest is the fact that within a recent twelve-month period conservation problems were highlighted by the convening of five international meetings, by the birth of the International Union for the Protection of Nature, and by the two recent world-wide conservation conferences, the United Nations Scientific Conference on the Conservation and Utilization of Resources and the International Technical Conference for the Protection of Nature. An examination of the two last mentioned conferences and their study of world-wide resource problems is the concern of this article.

These conferences, the first of their kind ever to be held, mark a significant milestone in effecting efficient programs of action in various countries and in furthering notable developments in world understanding, cooperative research, and conservation education. As pointed out by Dr. Fairfield Osborn in an opening-day address, the world conferences on resources are indicative "of the evolution of human society. A century ago, even a half-century ago, such a meeting would have been impossible. Slowly but surely the shackles of selfish nationalism are dissolving. Nations are commencing to sense that their well being is influenced by conditions in countries on the opposite side of the earth."

### ORIGIN AND PURPOSE OF THE FIRST WORLD CONSERVATION CONFERENCE

The United Nations Scientific Conference on the Conservation and Utilization of Resources, Lake Success, August 17 to Septem-

ber 6, 1949, had its inception in 1946 when President Truman called attention to the importance of conservation of natural resources for the purpose of safeguarding peace. In his letter of September 4, 1946, to the United States representative to the Economic and Social Council of the United Nations, the President concluded, "The real or exaggerated fear of resource shortages and declining standards of living in the past involved nations in warfare. Every member of the United Nations is deeply interested in preventing a recurrence of that fear and of those consequences. Conservation can become a major basis of peace." Furthermore, Mr. Truman pointed out the value of such a conference in mobilizing scientific knowledge and effective forces for promoting technical assistance to under-developed countries.

Following the receipt of the President's suggestion, the Economic and Social Council, fully cognizant of the "need for continuous development and widespread application of the techniques of resource conservation and utilization," called the above-mentioned United Nations Scientific Conference on the Conservation and Utilization of Resources (UNSCCUR) to concern itself primarily with the practical applications of science to resource management and human use rather than with minute refinements in research and scientific methodology.

The conference, attended by 706 participants from 51 countries, was designed to mobilize the scientific and practical knowledge "essential to equip the nations of the world for the task of raising and maintaining the living standards of their people." The value of bringing together scientists, economists, engineers, sociologists, resource administrators, educators, and other specialists in resource fields to exchange knowledge and share wisdom in a common cause was emphasized in the welcoming address by Secretary of the Interior J. A. Krug. "That cause," Secretary Krug continued, "is the improvement of man's standard of living, particularly in the under-developed areas of the world thru the protection and wise use of man's common heritage of natural wealth, wherever it may be.

"This is no selfish purpose. . . . It is a step in the direction of using the world's resources for the benefit of all its people. It is a great stride toward international teamwork on a high plane of knowledge and skill. I think you are participating in one of the greatest adventures of human will and mind in this century. . . .

Real conservation can remove economic pressures and fears of scarcity which have always played a large part in bringing on wars.

“Conservation touches not only the ability of the people to live well; it touches their ability to live at all. Conservation and wise development of our resources would insure world peace.”

In another plenary session Secretary of Agriculture Charles F. Brannan maintained that this meeting would help lay the groundwork for President Truman's program of aid to underdeveloped areas. “The Point Four Project could not be successful without knowledge of the world's resources.”

Tho the conference was not a policy-making body and, therefore, drafted no resolutions or recommendations for future activities, the exchanging and sharing of ideas and experiences among specialists was considered by the participants to be of monumental value.

#### ORIGIN AND PURPOSE OF THE INTERNATIONAL TECHNICAL CONFERENCE FOR THE PROTECTION OF NATURE

UNESCO (the patron of the recently organized International Union for the Protection of Nature) received from the Economic and Social Council an invitation to participate in the first world resource conference and to give special assistance by organizing the UNSCCUR meetings devoted to conservation education and training. UNESCO accepted this responsibility and, moreover, decided that it could best “serve the cause of Nature Protection” by convening concurrently with UNSCCUR an International Technical Conference on the Protection of Nature (ITCPN) Lake Success, August 22 to September 1, 1949. This arrangement was mutually beneficial to both conferences.

Sponsored jointly by UNESCO and the International Union for the Protection of Nature, ITCPN—attended by 125 participants representing 110 scientific and international organizations from 31 countries—was planned to study problems closely related to those for study by UNSCCUR, to make the most effective use of its documents, to take advantage of the presence of the many specialists whose simultaneous participation in both conferences could greatly enrich the programs and discussions, and to avail itself of the organization—translators, secretarial aid, etc.—assembled for UNSCCUR. Thus, a twofold policy evolved, conservation and utilization of resources viewed in the light of economic and social

aspects on the one hand, protection of nature and a growing concern for world-wide conservation education of the public on the other.

The ITCPN, unlike UNSCCUR, was a policy-making body to draft desired recommendations for action on both a national and international scale. The conference was charged with a major responsibility of examining the most effective means of educating the general public to a better understanding of man's relation to his environment.

#### NOTABLE ASPECTS

In a brief article it is impossible to consider all the significant developments and notable aspects of both conferences. However, of prime importance was the world-wide interest and the active participation of experts drawn from diverse areas in terms of economic, social, cultural, political, as well as geographical factors, and also from a broad range in fields of specialization. For the first time on an international level business executives, administrators, scientists, economists, engineers, technicians, educators, sociologists, and other experts in other fields related to resource development and human welfare met to share their knowledge and experience; to study how science and technology can best be applied to the development of resources and to the raising of the standard of living; and, in the case of ITCPN, to formulate statements of a world-wide policy relating to the protection of nature and to conservation education.

Furthermore, the conferences were notable for the comprehensive treatment of resource problems viewed in the light of their many complex interrelationships. Thruout the sessions there was evidence of awareness of the fact that "effective utilization of even a single resource calls not on one science but many."

For promoting general consideration of related problems, approximately half of the UNSCCUR program consisted of plenary meetings treating of subjects of common interest to participants irrespective of their fields of specialization. With a preview dealing with the legacy of resource depletion in the light of the increasing pressure upon resources, the plenary sessions examined, among other problems, the interdependence of resources; the planning of land-use for full production; improved techniques for using and conserving soils, forests, fuels, metals, and minerals; creatable resources; the adaptation of resource programs; education for con-

servation; resource techniques for less developed countries; and the use of resources for the enrichment of human life. The final UNSCCUR plenary meetings reviewed the outcomes of the conference, examined its contributions to the continuing work of the United Nations, and constituted a symposium on future lines of study and direction for progress.

Thruout these general sessions, the contrasting views held by both authors of conference papers and discussants made for a more comprehensive treatment. Sir Herbert Broadley was cognizant of these conflicting viewpoints when on the one hand he insinuated the disquieting note that "so far, we have only just begun to realize the dangers of world population hungry, underfed, ill and discontented," and on the other hand he voiced the opinion that "we have only glimpsed the possibilities of increased food production on a vast scale. . . . We are preparing for a new day . . . confident in the assurance that victory is possible—nay, sure—if we have courage, plan intelligently, and use all the resources of this world aright." Thus, from Dr. Hugh H. Bennett's warning that "our greatest hope lies in changing the way we use and treat the land" if civilization is to escape a tragic decline, the broadened program included discussions of creatable resources and the possibilities of new developments in science and technology for harnessing the oceans and utilizing sun power to alleviate the ills resulting from food and commodity deficiencies in this rapidly shrinking world with an ever increasing population.

While the plenary programs treated of problems of common interest to all specialists, the other half of the UNSCCUR program constituted specialized meetings of which there were five sections convening concurrently. Tho daily variations occurred as to program topics, these sectional studies included problems related to the conservation and utilization of minerals, fuels and energy, water, forests, land resources, wildlife, fish and marine resources.

Further evidence of the comprehensive treatment of resource problems by UNSCCUR is the fact that the plenary and sectional programs included 550 papers by authors from 47 countries. The invited discussants, selected because of their outstanding work, were also world-wide in representation.

A different approach to renewable resource problems was facilitated by the International Technical Conference on the Protection of Nature which had two plenary meetings and eleven technical ses-

sions. Three of the technical sessions dealt at length with significant aspects of conservation education; six treated of ecological subjects; one examined problems related to frontier parks, and one studied problems relating to the activities at the central office of the International Union for the Protection of Nature in Brussels. The background material for the programs included 100 special papers and more than 30 miscellaneous papers, few of which were read, but most of which served as a basis for the stimulating discussions in the technical sessions.

Even a more comprehensive treatment of resource problems was further facilitated by the provision by both conferences for well-planned visual-aids programs and carefully-planned field trips to supplement the subjects studied in the meetings.

However, it is significant that both conferences recognized the importance of bridging the wide gap between the degree of understanding possessed by scientists on the one hand and by the general public on the other. This serious deterrent to progress in conservation was treated in a rather comprehensive manner by the ITCPN which devoted three sessions to an examination of the following topics: Techniques Used to Make the Public Nature-protection Minded; Use of These Techniques in Educational Institutions; and Application of These Techniques in the Education of the General Public. Dr. William Vogt, chairman of these discussions, assisted by Dr. R. H. Eckelberry, who served as discussion leader for the second group, guided the discussions based upon twenty-six conference papers prepared by specialists selected because of their outstanding contributions to specific areas in conservation education.

The background material for the UNSCCUR programs on education and training for conservation included nineteen papers and a comprehensive report, *Education for the Conservation and More Efficient Use of Natural Resources*, prepared by Alain Gille of the UNESCO staff. The above-named study was based upon an inquiry made in thirty-one countries to determine in each the role of education in effecting conservation practices and the methods used for encouraging the protection and more efficient use of natural resources. During one of the UNSCCUR programs, Dr. M. M. Coady of Nova Scotia held that the world-wide misuse of natural resources stems from ignorance, from lack of ownership, and from profit making and power seeking motives. Believing, therefore, that formal education in the schools is not enough, Dr. Coady maintained

that the short-cut to human progress is to mobilize the adults of the world for continuous learning—even if they now have little education.

Both conferences evinced a widespread recognition that only an education based on scientific findings and designed to facilitate national understanding can make possible the wise use of natural resources, a requisite for establishing conditions favoring continuous peace and living conditions fit for mankind. Universally recognized was the inadequacy of present-day education for conservation even in the more advanced countries. Moreover, the belief was prevalent that the first condition of success in vitalizing conservation and, thereby, improving human welfare “rests upon an immense educational task.” Yet, in spite of the emphasis placed on the urgent need for conservation education, the number of educators invited to participate was small. Their representation was not in proportion to the weighty responsibility which devolves upon them.

The ITCPN, unlike UNSCCUR, was notable for the pronouncements which it formulated. Among other things, the resolutions adopted deal with such subjects as the development of an adequate methodology for the study of human ecology; the introduction of the teaching of the principles of conservation and nature protection in all schools at all levels of learning; the establishment of a Permanent Joint Commission on Pesticides or some other appropriate means of coordination to deal with the problems of insecticides; the preservation of vanishing species of fauna and flora; the establishment of control over the introduction of exotic species; the facilitation of duty-free exchange of films, books, and other documentary material dealing with the protection and conservation of renewable resources; the promotion of international fellowships for study and training; and the encouragement of the greatest possible degree of collaboration between the organizations concerned with nature protection and conservation and those concerned with the utilization of resources.

Of the twenty-three resolutions adopted, five relate specifically to conservation education and training. Most significant among these are the following:

*“Resolution No. 1*

WHEREAS: The United Nations and its Specialized Agencies are studying programmes of technical assistance for under-developed countries, which programmes to be effective require the application

of human ecological principles, ecology being understood in its widest sense to include all human relationships—individuals and groups—with the problems discussed, it is essential that existing information should be collected and new studies that are urgently needed should be initiated;

WHEREAS: It is recognized that one of the first and greatest responsibilities of the United Nations and its Specialized Agencies concerned with the use of resources, and of the International Union for the Protection of Nature, is to increase knowledge of human ecology, and to assure its application on a scientific basis;

WHEREAS: This Conference recognizes the necessity of close and continuous integration of all programmes and methods for the study of human ecology,

*Therefore This Conference Resolves:* That the International Union for the Protection of Nature recommend to the above-mentioned bodies the promotion of studies of suitable areas as a step towards the development of an adequate methodology for investigation of human ecology; . . .”

*“Resolution No. 6*

*The Conference Resolves:* That the International Union for the Protection of Nature recommend to UNESCO that it inform governments of the vital need for the introduction of the teaching of the principles of nature protection and conservation in the curricula of primary and secondary schools, and of universities and technical colleges, either as special courses or as part of existing one related to the subject matter.”

Unquestionably, these two conferences mark an important event in the history of conservation. They contribute much towards arousing world-wide conservation consciousness, towards developing world understanding in many significant phases of conservation problems, and towards establishing action programs designed to effect harmonious relations between man and his habitat. These prerequisites to a dynamic role for conservation further the preservation of human welfare and the establishment of continuing peace among divergent peoples.

## A GEOGRAPHIC STUDY OF THE VILLAGE OF COTOCOLLAO, ECUADOR

LEA T. HEARN

Colegio Americano, Quito, Ecuador

### LOCATION

Located Northeast of Quito, in one of the intermontane basins of the Andes, is Cotocollao, a town having an urban relationship to Ecuador's capital. Nevertheless, it is possible in Cotocollao to turn back the clock, leave the modern world of machines, and enter an environment where the source of power for labor is the human body assisted by that ever-patient and dependable little animal, the burro. The Indians and mestizos of Cotocollao are little more than sleepy beasts of burden, whose existence, though happy and carefree, is based on a struggle for life's fundamental necessities, food, clothing, and shelter. Luxuries are as foreign to the citizen of Cotocollao as his want and privations are to the wealthy.

### THE VILLAGE

Dwellings lining the ancient cobblestone streets are distinctly geographic in aspect, being constructed of adobe, an attribute of the environment.

The plaza or public square of the village is indicative of the process of acculturation accomplished as a result of the Spanish conquest of the Sierra. "Tiendas," stores and shops, are prominent and famous for their "choclos," green sweet corn either on the cob or cut off; chifles, fried banana chips; and empanadas, dough stuffed with rice, meat, corn, cheese or onions and fried in deep fat. Corn, meat, and cheese from farms in Cotocollao are used in making such delicacies.

### AGRICULTURE

After leaving the plaza, distances between dwellings increase and agriculture becomes the dominant occupation of the populace (Fig. 1). In spite of primitive implements, such as stone hoes, digging sticks made of eucalyptus wood, and crude plows, agriculture is well advanced. Land is well cultivated, soil fertility is guarded, and the average Indian loves his plot of ground with a passion beyond normal comprehension. Corn, onions, garlic, potatoes, squash, beans, carrots, medicinal plants, and oats comprise the harvest of Cotocollao.

Harvested crops are transported, either by burro or human means, to Quito where they are sold in markets. It may be readily deduced that the produce of Cotacollao is very important in feeding the populace of Quito, which is, for the most part, employed in offices, stores, government work, or professional activities, and which is entirely dependent for its food supply on the husbandmen of the surrounding productive countryside.

Manure is provided by animals such as pigs, chickens, and



FIG. 1. Garden containing squash, onions, potatoes, beans, and carrots.

sheep; human excreta is also used to increase soil fertility. Simple crop rotation is followed and legumes are usually planted in an area from which a crop of corn has been harvested.

#### VEGETATION

Predominant vegetation at lower elevations consist of maguey and cacti indicative of the xerophytic character of porous volcanic soil.

At about 2,080 meters, with an increase of moisture, the vegetation pattern changes from drought resistant plants to phanerophytes, eucalyptus dominating. The eucalyptus, a savana plant

which grows in profusion in Australia, was introduced to Ecuador by President Gabriel Garcia Moreno.

With ample moisture assured, the eucalyptus grows in great profusion. Economically, this tree is of great significance. It is used as a fuel in the kilns of Cotocollao where ceramics are manufactured. Other uses include the manufacturing of furniture, and, as a common household fuel.

Beyond the altitudinal zone of the eucalyptus, is the lush grass

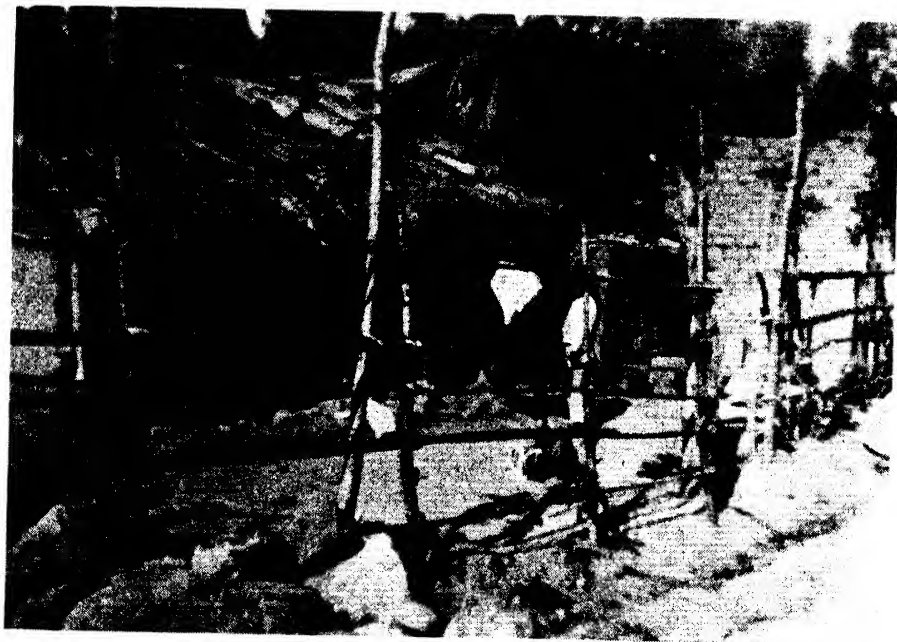


FIG. 2. Typical dwelling of Cotocollao.

of the paramo, a grassland located above the snow-line. Here, vegetation adjusts itself to climatic factors of wind (accounting for the tufted appearance of the dominant plants, grass); moisture; and freezing temperatures. Man, too, makes an entirely different adjustment to his environment in that pastoralism becomes the dominant activity. Sheep, goats, and cows are herded and driven in transhumance rotation to various pastures provided by the paramo.

#### HABITATIONS

Habitations, constructed of materials indigenous to their site, are, therefore, distinctly geographic (Fig. 2). Altho individual

dwelling differ somewhat as to size, number of rooms, and materials used, they are essentially similar. The majority of huts are built of adobe, cornstalks, and thatch. Doors are usually of wood and windows consist of portals in walls with no glass or screening. However, sometimes, crude blinds are used to shut out rain or sunlight. Interiors of huts are dark. In general household furnishings include: bedsteads; mortars and pestles; pottery; crude fireplaces used to cook the daily fare; raw wool; and sacks or woven baskets filled with corn or other grains awaiting transport to Quito markets.



FIG. 3. Woman grinding corn in a typical stone mortar. Note hollowed wooden bowl and conical pot in the background.

Women pounding out cornmeal in mortars and storing the ground corn in stone receptacles are seen frequently (Fig. 3). If mealtime is approaching, huge pots, conical in shape, may be seen suspended over a fireplace. The fireplace usually consists of three, large, rectangular stones arranged in a semi-circle. The stones are placed so that when the pot is put over the fire, it is supported by the rocks, and, at the same time, suspended over the flames.

Household animals such as guinea pigs and rabbits are very popular and scoot about the house unconcerned that they will soon be eaten as delicacies. Chickens, pigs, sheep, and dogs are also kept.

## ACTIVITIES

**Manufacturing.** For the most part, villages located north of Quito are endowed with geographic attributes of site, which, when utilized by man favor the development of handicrafts. To illustrate this, several villages located north of Quito may now be cited as examples. Pomasqui has a cord sandal or *alpargatas* industry which is based on utilization of the maguey plant which grows in profusion in the arid soil of Pomasqui (Fig. 4). Pomasqui is geographically



FIG. 4. A family in the village of Pomasqui making alpargatas.

located in the lee of rain-bearing winds. Its aridity is a natural outcome of geographic location in relation to orographic factors. Manufacture of cord sandals is limited to sites where maguey or agaves grow. Thus, we see, in the case of Pomasqui, that the climatic factor of aridity and the resulting plant growth has influenced, thru man's adjustment to the attributes of his environment, the development of home industry.

San Antonio, also located north of Quito, is noted for an industry unique to its geographic position. The soil of San Antonio is composed of calcareous material<sup>1</sup> which is mined, transported to

<sup>1</sup> Monte pululagua "cal cruda."

kilns, heated until the impurities are removed and a residue called "cal calcinada o viva" remains. This last used in cities for "white-washing" houses.

Cotocollao is also one of the villages of the north which is endowed with certain geographic resources enabling it to develop home industries. Cotocollao is famous for its adobe bricks and ceramics which are sold in Quito and surrounding villages.

**Weaving.** Weaving is a home industry and pursued largely to fulfill family necessities. Fluff provided by the "sixe" plant, a

type of grass, is utilized. A long wooden stick is used to wind the fiber into thread. Wool, of course, is also used. Weaving in Cotocollao, however, is on a primary<sup>2</sup> level, and, cannot be compared with the advanced skill of the Otavalenas.<sup>3</sup>

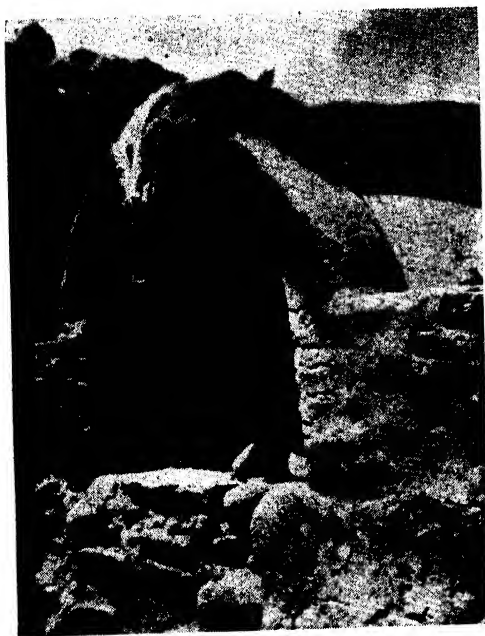


FIG. 5. Outside oven used for baking bread.

**Potable Water.** None of the dwellings is provided with running water. Habitations located at higher altitudes, nearer the paramo, depend on streams and rivers for drinking water. Dwellings located near the plaza obtain potable water from a public fountain which provides water from government wells.

**Washing.** As tradition has decreed, Indian women of Cotocollao carry the family wash to a nearby river. Here, lather obtained from the century plant's leaves is used for soaping; clothes are pounded and slapped against huge boulders and rinsed in cold mountain streams until clean. While the women wash, young children sit along the banks of the rivers awaiting their mothers' return to their homes. Clothes are spread on bushes or along the grassy banks to dry.

<sup>2</sup> Primary level, initial stage of development.

<sup>3</sup> Otavalenas, Indians inhabiting the village of Otavillo, located 75 miles Northeast of Quito.

**Baking.** Baking bread is accomplished in outside ovens (Fig. 5). A fire is built in the bottom of the oven; the dough, usually cornmeal flour, is pushed into the top part of the oven on a long wooden shovel, and removed in the same fashion when completely baked. Corn-bread is the staple.

**Sanitation.** Sanitation facilities are unknown in the Indian's way of life. He resents hygienic customs as he does the "white" intrusion on his way of life and traditions handed down by his ancestors. The Indian persists in living in the same house with his animals. Many diseases are carried by rabbits and guinea pigs which share the domicile with their master.

Food is prepared in a very rudimentary fashion. Infection through uncleanness is dominant among the Indians.

### CONCLUSION

Cotocollao is located on the geographic periphery of the capital of the Republic. Therefore, it can be readily seen that influences from the city of Quito have greatly affected the culture of Cotocollaos. The former tribal organization found in areas further removed from the center of social, political, and economic life has been totally eliminated in Cotocollao as a result of its urbanization.

Life in Cotocollao is an excellent example of man's adjustment to attributes of his environment. Here, agriculture dominates and, as has been demonstrated, life adjusts to geographic factors of altitude, rainfall, light, soil, and natural vegetation.

## THE WORLD'S GREATEST INLAND SEA—THE MEDITERRANEAN\*

W. O. BLANCHARD

University of Illinois

Altho the Mediterranean basin actually includes parts of three continents, it is usually regarded as a geographic province of Europe. The Near East and north Africa have their commercial, political and cultural ties mainly with people across the Mediterranean. That sea has been a far less formidable barrier than the vast mountains and deserts in the interior of Asia and Africa.

While considered a geographic region of Europe, the Mediterranean region is unusually distinctive. Its lands are not merely an extension of north and central Europe; neither are its waters just an arm of the Atlantic. Shut off by an almost continuous wall of mountain and plateau, it is dominated by its master feature—the Mediterranean Sea itself—in many respects a most unusual body of water. The term "Mediterranean" has come to designate one of the most distinctive regions of the earth.

### THE FACTOR OF SIZE

The Mediterranean is by far the world's largest inland sea. From its surface, there could be carved a dozen waters; each one as large as all of our Great Lakes combined or, if you prefer, it would make half a dozen Baltics.

Its depths are equally impressive, almost a mile on the average, nearly three miles in its deepest part. It is interesting to note in passing, that all three of Europe's northern seas, the North, Baltic and White, have negligible sections over 600 feet deep, while in the south, the Mediterranean, Black and Caspian, have extensive areas more than ten times that depth.

Here then is an enormous volume of water, a major earth feature, which by sheer bulk alone, is bound to impress its own peculiarities upon the entire region about it.

\*The following are other geographical studies of Europe's coastal waters by the same author:

1. The Baltic Sea—Commercial Blind Alley, *JOUR. GEOG.* 43, 2, 1944, 62-70.
2. The Curious Caspian, *News Map Mag.* 2, 7, 1940, 14-15.
3. The Black Sea and Its Borderlands, *Trans. Ill. State Acad. Sci.*, 35, 2, 1942, 111-112.
4. Seventy Years of Suez, *Sci. Mo.* 50, 4, 1940, 299-306.
5. Gibraltar—The Rock and Strait, *News Map Mag.* 3, 2, 1940, 2-6.

## SHAPE

Unlike its American prototype the Caribbean, the Mediterranean has a decidedly elongated form. In fact it is about four times as long as it is wide. If superimposed upon southern United States, as shown in Figure 1, it would reach from coast to coast. This shape is highly advantageous commercially and its deep penetration gives Asia what amounts to a water frontage on the all-important North Atlantic.

The Mediterranean coast presents an almost infinite variety of forms. The African-Asian portion is markedly regular; the European, on the contrary, is a series of peninsulas, islands, bays and straits. The latter coast has approximately twice the length of the African section.

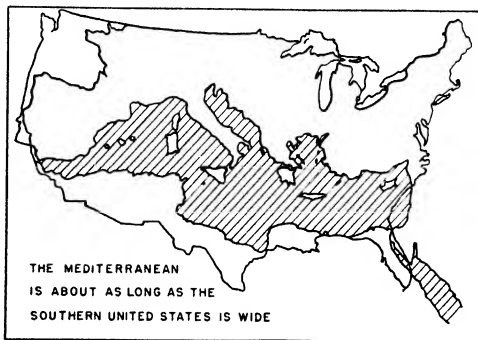


FIG. 1

Only one of the peninsulas, the Balkan, has been severed by a ship canal. The Corinth Canal, only four miles long, saves a maximum of 175 miles but it is narrow and troubled by a swift current.

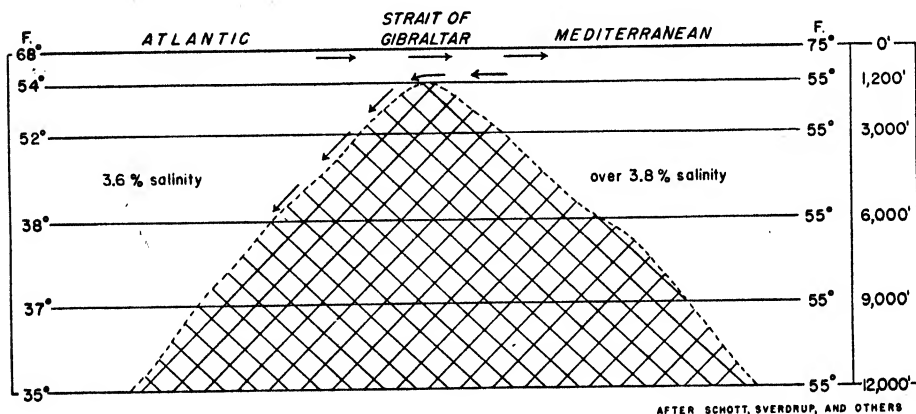
The great variety of relief found about the margins is duplicated in the Sea bottom. If drained, instead of a single long trough, the depression would be found to be divided into a series of great caldron-like basins separated from each other by ridges which are both narrow and steep. Some of these partitions appear in places above the surface as capes, peninsulas and islands. Extensive faulting as well as violent folding have combined to produce these remarkable irregularities.<sup>1</sup>

One of these ridges divides the whole Sea into two major sections—an eastern and western basin. Italy, Sicily, Malta, and Pantellaria are visible portions of this submarine ridge. The eastern basin is about twice the size of the western and it lies much farther south, an important factor in bringing the desert to the water's edge. This narrow constriction between the east and west basins, like the Gibraltar and Suez gateways, is of great strategic importance, especially in war time.

<sup>1</sup> There has been reported in one place, at least, a difference in depth of 1,500 feet in the short distance between the prow and stern of a ship.

Tho historically old, the Mediterranean is geologically young; in fact, it has been formed since man has been on earth, and it is still growing. Numerous volcanoes, some of them active, as well as many crater lakes, lava and cinder deposits and frequent earthquakes, all bear evidence of its geologic youth. These "growing pains" are not merely of academic interest; they are serious factors in the economy of extensive areas of the region.<sup>2</sup>

Junction of the Mediterranean with other waters is effected at three places. In the northeast the Bosphorus, Marmara and Darda-



WATER TEMPERATURES, SALINITY, AND CURRENTS  
IN THE STRAIT OF GIBRALTAR

Fig. 2

nelles gives access to the Black Sea, a sort of "blind alley" alcove. In the southeast, the Suez isthmus has been cut making a sea-level ship canal junction with the Red Sea and Indian Ocean. At the western end, Gibraltar Strait gives access to the North Atlantic.

### GIBRALTAR STRAIT

To the world at large the name Gibraltar stands for the great rock fortress, but it is the strait at the foot of that promontory which has most notably influenced the waters of the Mediterranean.

This gateway is very narrow, about eight and one-third miles at one place, and likewise very shallow since it is crossed by a submarine sill which rises to within some 1,200 feet of the surface. The

<sup>2</sup>In southern Italy the fatality rate due to earthquakes averaged about 1,000 per year for a whole century.

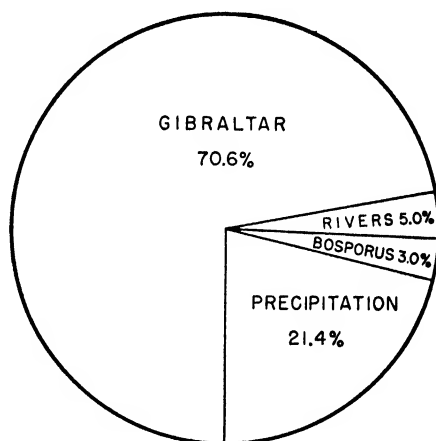
constricted width almost eliminates tidal movement east of the strait while the submarine ridge prevents the entrance of the deep cold waters of the Atlantic.

The Mediterranean is a region of small precipitation but large evaporation.<sup>3</sup> Run-off is also small. This adds up to a marked deficiency in water and a high degree of salinity.<sup>4</sup> The volume deficiency is compensated for by a strong inflowing surface current thru Gibraltar. The higher density of the Mediterranean water results in a somewhat smaller outflow at depth. This latter pours over the sill like a submarine waterfall as shown in Figure 2. There is a similar but smaller exchange with the fresher waters of the Black Sea. The balance sheet of intake and outgo is shown in Figure 3. It will be noted that about 70.6 per cent of the water deficiency is made up by the excess inflow at Gibraltar. There is practically no current thru Suez.

This rigid control exercised by the Strait is reflected in the waters of the Sea which are not only high in salinity but in temperature as well.

The temperature status is also shown in Figure 2. It will be found that in winter for the surface waters, there is little difference in the two sides of the Strait, but at depth, say anything beyond 300 feet, the Mediterranean shows 54° to 56°. In the Atlantic at depths of 12,000 feet or more the water temperature is 34° or 35°. For summer, the surface waters of the Sea get very warm, but at depth they remain about the same as in winter.

On the whole, then, the Mediterranean is a huge reservoir of very warm and very salt water. Its influence, combined with that of the mountain wall which excludes northern cold winds, makes the



MEDITERRANEAN WATER BALANCE

AFTER SCHOTT, G.

FIG. 3

<sup>3</sup> The evaporation rate in the Mediterranean is estimated to be about one-third greater than in the Atlantic in the same latitude.

<sup>4</sup> The salinity is about four times that of the Baltic.

climate of the entire region considerably warmer than normal for that latitude.

### TIDES AND CURRENTS

The limited communication thru the Strait is also important in influencing the movements of Mediterranean waters. Tidal movements are almost lacking and the general circulation, a counter-

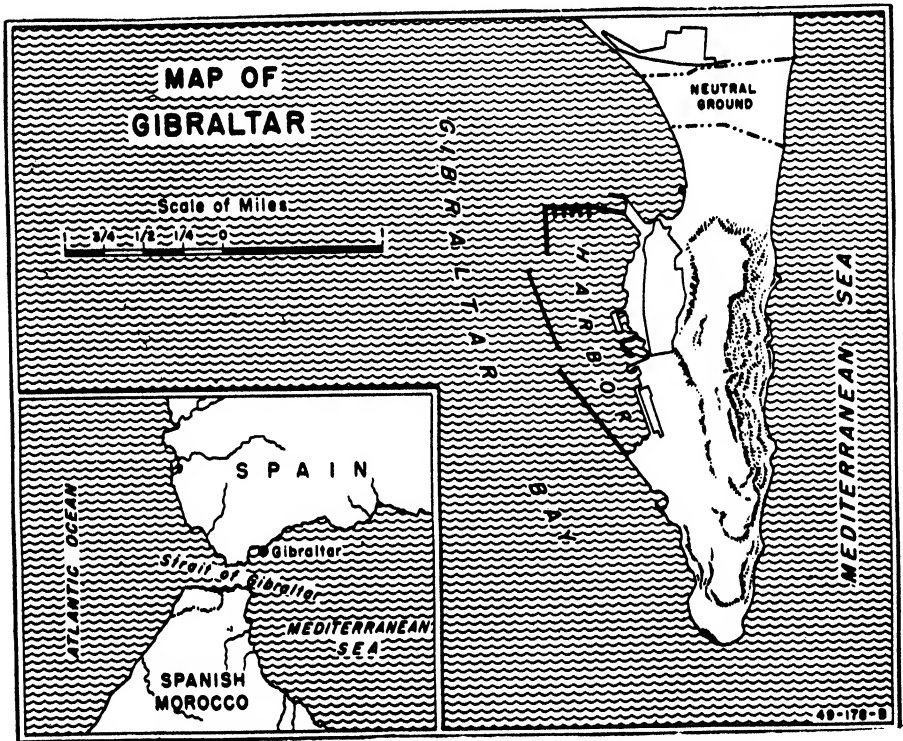


FIG. 4

clockwise current, is rather weak. The rise and fall of the waters is more often due to winds and currents than to the moon.

In ancient times the near absence of tidal movement was an advantage to mariners. The small craft then in use could be beached almost anywhere. However, without the tidal wash, rivers have tended to form deltas, bad, both as sites for port cities, and for navigating the rivers.

The current which skirts the Mediterranean with its load of silt, has made it necessary to locate ports to one side of the river mouths and away from the drift of the current. Alexandria, Venice, Marseilles and Barcelona illustrate this control. Port Said and the

Suez Canal opening, by necessity located east of the Nile delta, has a constant struggle with the silt from that river.

### RESOURCES

The fish resources are in decided contrast to those of north-western Europe. The waters are mostly very deep and both temperatures and salinity are remarkably uniform. This latter discourages currents which distribute oxygen and food. The warmth ex-

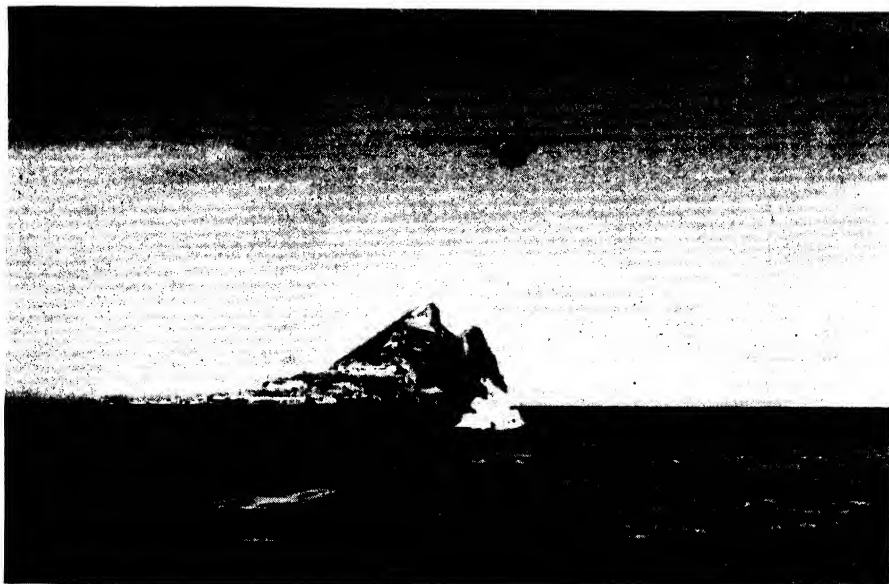


FIG. 5. Looking north across the Strait. British patrol bomber practising with smoke bomb. Courtesy British Information Office.

cludes such important commercial temperate zone fish as the herring, cod and halibut and substitutes the less valuable tuna, sardine and anchovy. Fishing has always been a source of local food supply carried on by small operators, using rather primitive methods, and with meager returns. The number of species is large, but the fish are small and bony. There is a large fish import from Atlantic countries.

Salt production from the Mediterranean waters is an age-long industry for recovery conditions here are almost ideal. High salinity and a high evaporation rate makes it possible to admit the waters to shallow lagoons, close them off and then let the sun do the work.

same thing can be said for adults and out of school youth.

A third area embracing common interests and goals is the methodology of instruction. Since the turn of the present century when John Dewey's "School and Society" was published, school leaders have become more cognizant that learning is a growth and developmental process, that "pouring in" or imparting knowledge unrelated to life's problems and issues does not work. As a result, it is now recognized that good teaching is aimed at assisting people to solve problems of concern to them. However, implementation of the growth-process and problem-solving concepts demands teachers who are trained in ferreting out issues of real concern to people. Such teachers cannot satisfy requirements by manufacturing learning situations or by depending exclusively on children's interests.

The real, the live, the important problems and issues spring from the lives of people, the environments surrounding them, and in the ways they react to that environment. To give learning vitality, a goodly share of problems attacked should be "close to home." These problems can be readily observed and understood by pupils. More important, they can be solved. But to get this job done there must be a corps of teachers well-grounded in an understanding of the environment in which they work. Teachers must have a more profound understanding of the locality in which their pupils live; they should be given opportunity to study it first-hand during their pre-service or in-service training. In this, the contributions of geographers are essential.

A fourth major common interest, not only of geographers and rural school men but of people everywhere, is the conservation of our natural resources. The destruction of this country's physical resources by three or four generations of people stands as one of the greatest social immoralities of our time. What these years of thoughtless and often knowingly willful action portend for the future perhaps cannot be evaluated fully at present. This we do know: thousands of people driven from their homes by dust storm and flood; hundreds of thousands of people eking out a bare sub-standard level of living on once-rich soil long since robbed of its life sustaining powers; divided forest land, silt laden rivers, eroded and gullied hillsides, wasted minerals and fuels—these things we see. Moreover, we know that unless this wastage is stopped the future of on-coming generations will have been irrevocably determined by the present.

Rural people are largely the guardians of the nation's physical resources. Upon them directly, and indirectly thru their cooperation with governmental and other agencies, much depends. But in this, we cannot rely entirely upon the techniques, knowledges, and skills filtering from state and national agencies down to the local people. A thoro-going program of education is needed at the local community level for children, youth, and adults and involving the cooperative participation of all agencies and resources that can be of assistance. In this cooperative endeavor the resources of the geographer are essential. His contributions can give the people a deeper and broader understanding of the relationships of physical resources at the local level to community ways and standards of living as well as to state, regional, and national well-being. Equally important, he can assist school and community leaders in setting up action programs for improving local conditions.

Altho the ecology of plant and animal life has long been studied as to variation and adaptations, lately plant physiologists and nutrition experts have been exploring another aspect of environmental influences. These scientists have found great variations in the mineral and vitamin content of the same variety of vegetable grown in different sections of the country. They have found that the nutritive value of any food crop depends on more than soil fertility and on how the crop is cultivated, fertilized, and irrigated. Climatic conditions—amount of sunlight, temperature, atmospheric humidity, and wind movement—are also determining factors in nutritive value of plant and animal foods. One soil scientist<sup>1</sup> mapping rainfall-distribution and rainfall-evaporation ratios with variations in soil fertility, arranged a composite map showing patterns of soil construction and development for the country. Taking data on the incidence of dental caries among 69,000 Naval inductees, he spot-mapped their home addresses. His findings were:

The concentration of dental caries gives a reciprocal curve of that for soil development under the climatic forces. The minimum of caries is in the mid-continental area of maximum soil construction. They increase in going westward from there to soils less developed, and more so in going eastward to soils more highly developed.

He further concluded:

If all other body irregularities as well as those of the teeth were so viewed, it is highly probable that many of our diseases would be interpreted as degenerative

<sup>1</sup> W. A. Albrecht, "Our Teeth and Our Soils," *Annals of Dentistry*, Vol. 6, No. 4, December, 1947.

troubles originating in nutritional deficiencies going back to insufficient fertility of the soil.

Climatic conditions, state of soil development, nutritive content of foods, the health of people—these relationships are the concern of rural educators and of geographers.

A last major goal grows out of some of the trends in rural life mentioned earlier. American agriculture is employing fewer and fewer workers. At the same time there is an increase in part-time farming indicating that it is steadily decreasing as the total concern of farm people. Moreover, the number of commuters from the villages and open country surrounding cities suggests there are basic values in rural living that more and more people are coming to appreciate. But fully half all rural young people migrate to the city for employment. Many rural leaders deplore this mass exodus and wish it could be at least decreased. But rural young people will continue migrating until the situation is changed. They want opportunity and they will leave their homes to find it. Perhaps schoolmen, geographers, and others could help them. Rural villages have the manpower available for the establishment of local industries. They have the room for factory sites and for more housing. Many of them have right at hand the physical resources—raw materials, minerals, fuel and water supply—necessary to establishing a small plant or industrial project. But rural people need help in assessing and evaluating their resources to make continued progress possible.

If our schools are really committed to the objective of improving the quality of community living, every aspect of living not being met adequately is within their province. And every individual serving the community thru its schools must assume his unique share of the task. Here is a job to be done: helping the people to help themselves. Geographers and schoolmen have a common task in helping them.

## GEOGRAPHY IS VITAL TO THE BUSINESS STUDENT

L. M. WANTLAND

Centenary College of Louisiana

The need for a broader knowledge of the keen competition among the nations of the world as against the immediate and practical demands from without is clear and decisive. There was never a time in American history when it was so necessary for students and scholars to have an appreciation of the world-wide situation concerning land distribution and the basic economic problems involved as it is today. The truth of this statement no one can challenge.

Education seems to be the best solution. Education may be defined as a process of helping individuals to react satisfactorily to their environment. This process includes the gathering of information, growth in knowledge and understanding, and the development of right attitudes, appreciations, habits, skills and abilities.

In the consideration of the need for more courses in economic geography for students in many fields of study, and especially for those majoring in business administration, I should like to indicate certain essential aspects.

1. Economic Geography is helpful to accounting majors who may become comptrollers; hence they would need to know the sources of raw materials, costs of transportation, costs of marketing products in various areas, and so on. For industrial management students the course provides a background of information relating to the sources of materials, possible plant locations, transportation of raw supplies and finished products. Economic Geography correlates readily with the other basic courses. The background received in the Economic Geography course enables the student to understand better the specialized and more advanced courses he will encounter during the later years of his program.

2. Economic Geography is highly important in the field of marketing, in helping to solve the problems of distribution, in questions concerning de-centralization, in transportation, and in numerous other facets of our business world. A better understanding of Economic Geography would be of great value in drawing up recommendations for business developments.

3. Economic Geography plays a vital part in our business life. In some fields of endeavor it has a very direct concern with the business operations, and it is a high priority matter. I am thinking primarily of resources of the land from which important products and by-products are obtained.

An example of this is high grade oil reserves. As these reserves diminish, we face the problem of finding new resources, and among these is the possibility of processing low grade oils; provided, of course, it can be done at a cost in keeping with the results achieved. Consequently, we are doing a great deal of research in connection with processing such low grade oils, comparable to the extraction of iron from taconite.

## RESULTS OF A QUESTIONNAIRE

One hundred questionnaires concerning the status of Economic Geography were mailed to college and university administrators in all sections of the country. Seventy-five questionnaires were returned from colleges and universities in Arizona, Arkansas, California, Illinois, Iowa, Kansas, Oklahoma, Louisiana, New York, Ohio, Pennsylvania, and Texas.

62 out of the 75 institutions offer Economic Geography.

59 stated that the hours devoted to this course average eight.

44 average 4 hours required of business administration majors.

26 schools use business administration instructors to teach geography.

36 schools use geography or geology instructors to teach geography.

60 schools believe that their business administration majors should take an average of 3¾ hours of Economic Geography.

Virtually every department head agreed that we should offer more courses in geography and should stress particularly Economic Geography.

The following brief comments were selected from the statements of business administration heads in various colleges and universities. Unless otherwise designated, all of the schools mentioned are fully accredited four-year colleges or universities.

- a. From New York City. Economic Geography. "Six hours are required for undergraduate and three hours for graduate students."
- b. Niagara, New York. "This subject has suffered by neglect; most junior high school students are better informed on it than the average college student."
- c. Columbus, Ohio. "Five or ten hours of freshman work for nearly everyone. Varying numbers of advanced course hours are required in the curriculum in marketing and even more in the curriculum in foreign trade."
- d. Cleveland, Ohio. "Emphasis should be on *economic* rather than geographic."
- e. Tulsa, Oklahoma. "Over 90 per cent of majors take at least eight hours of geography and geology."
- f. New York University. "Economics students may now have a field of specialization in Economic Geography."
- g. Abilene, Texas. "This field should be broadened, especially in view of the world position the United States has taken in the past few years."
- h. Commerce, Texas. "In marketing (and other courses) many students display woeful ignorance of plain 'place geography' to say nothing of economic geography."
- i. Houston, Texas. "Too few people really know enough about the commercial resources of their own state and nation."
- j. Philadelphia, Pennsylvania. Wharton School of Finance, an independent School of Commerce, "We determine our own curriculum in all aspects, and have required Economic Geography for almost half a century."

At both the University of Minnesota and the University of Oregon it is generally assumed that the business student needs to

have the broader background of climate, land formations, peoples, methods of production, and so forth, which is not presented ordinarily in the school of business.

#### BUSINESS MEN RECOGNIZE ECONOMIC GEOGRAPHY

The importance of Economic Geography is recognized by many commercial and industrial leaders. Mr. R. W. Burgess of the Western Electric Company says that a knowledge of various topics in Economic Geography is helpful in analyzing a considerable number of business problems. In the consideration of the value of this knowledge, Mr. Burgess cites the following examples: supply and demand factors bearing on the availability and price of the various raw materials which the company uses; possible markets for the company's products; effects of tariffs, quotas, and other restrictions on international trade; forecasts of industrial activity as affected by world business and political conditions; and geographic factors in this country.

Mr. J. E. Hill, assistant to the president of the United States Steel Export Company says, "We feel that the importance of a thoro knowledge of this subject cannot be stressed enough as basic knowledge in a company such as ours."

Mr. A. L. Janson of the American Tobacco Company says, "I am sure that anyone engaged in business would be sadly handicapped if he did not have some knowledge of Economic Geography. A well-developed knowledge of the subject would undoubtedly be of great help, particularly to the executive in business."

The Du Pont Company states that it is certainly desirable for any business administrator to be well grounded in economic Geography.

The Aluminum Company of America submits, thru one of its representatives, the following assertion: "An affirmative answer to your question is quite obvious to us: economic factors of geographic significance are definitely important in the aluminum industry."

From the Firestone Tire and Rubber Company comes the following comment: "I am sure it will be obvious to you that the economic success of many companies is completely dependent upon their geographical locations in regard to transportation, tax, labor and power costs."

Mr. George Vidal, publicity director of Sears, Roebuck and

Company, states, "Because of the fact that our concern is a distribution agency operating in all parts of the nation, we have for many years watched closely the growth and development of different areas. There are many other instances where we have foreseen business opportunities based on favorable factors having to do with the geographical location of certain areas, and we have capitalized on them in a very important way."

The General Foods Corporation draws its raw materials from all over the world, and their markets are spread over an exceedingly wide area. For these reasons they believe that a knowledge of economics and geography—and particularly integrated—would be of definite value to anyone considering entering their field.

#### RESULTS OF OTHER SURVEYS

From a survey conducted by the United States Office of Education, it was found that approximately 68 per cent of all institutions of higher learning offered at least one course in geography; the exact figures were 689 out of 1,015 colleges and universities surveyed. Professional schools and junior colleges were not included in this survey. When sufficient courses were offered for a major or minor in geography, Economic Geography was nearly always offered; and the same condition was true in those institutions which offered only one or two courses in geography. When Economic Geography alone is offered, it is given in most cases by the school of business or commerce, or in the department of economics; and is all too often taught by an instructor who is untrained in the subject. Apparently, then, Economic Geography is the most widely offered course in geography—probably one-half the colleges in the country offer such a course or courses. Unfortunately, however, the South—in general—has lagged behind most other regions in the offerings of geography.

On June 23, 1948, the Southwestern Publishing Company completed an analysis of a total of 1,303 college catalogues in order to obtain statistics on various college courses. They found that Principles of Economic Geography is being offered in 527 colleges and universities; this figure represents a total of 40.5 per cent. In addition, 2.7 per cent are offering a course entitled Economic Geography of the United States; 2.1 per cent provide a course entitled Economic Geography of North America. Economic Geography of South America is offered in 2.7 per cent; Economic Geography of Europe

in 2 per cent; and Economic Geography of Asia in 1.2 per cent—a total of 51.2 per cent.

It is interesting to note also that many schools are offering a very recent course called Conservation of Natural Resources. This new course is offered in 160 colleges in the survey, or 12.2 per cent.

### PURPOSES OF ECONOMIC GEOGRAPHY

Economic Geography has both practical and economic purposes. It is all too obvious that it is the opinion of many major companies that courses in Economic Geography would be of definite value to a business administration student as a very essential part of his general college education. Broadly speaking, Economic Geography deals with the inter-relationship between the physical environment and man's productive occupations.

The two most common methods of approach to this subject are (1) regional and (2) topical. The regions may be political, climatic, based on relief features, or based on the chief products sold.

#### *Practical Purposes of Economic Geography*

1. Provides students with facts about sources of foodstuffs and raw materials, their manufacture and distribution.
2. Students learn reasons for the location of industries, including both natural and human factors.
3. Outlines a study of the factors affecting trade between nations.
4. Provides a survey of the principal nations from the standpoint of their productive regions and leading products.
5. Shows relationship of factors affecting production.
6. Opportunities to discuss the values of strategic materials which affect trade and international relations are necessary to an understanding of much of the foreign policies of nations.

#### *Cultural Purposes*

1. Geography is a broad, inclusive subject and helps to bind together the principles learned in economics, anthropology, climate, and other sciences and courses.
2. It provides information needed by any educated person about the world, the economic basis for industries, international relations, and domestic problems.
3. The study is concerned with dwindling resources of minerals, timber, and forests which must be maintained or substitutes found—if our present standard of living is to be retained.
4. The study of Economic Geography is valuable for an intelligent citizenship in the future, for intelligent reading, and for drawing conclusions from the news.

#### *Other Uses*

1. Provides experience in interpreting maps, including those of distribution of commodities, and main trade routes.
2. Shows the practical use of statistical information.
3. Applies to urban planning and regional planning, both of which are fundamentally applied geography.

4. Because geography is a dynamic subject, and the facts are constantly changing, it is of value—especially to students of business and politics—to learn that few factors are static; and that if one wishes to succeed in business or show political stability, he must learn to draw conclusions based on the constantly mobile conditions.

### CONCLUSION

From the abundance of proof offered, it is obvious that the consensus of opinion is that a knowledge of Economic Geography gives a student an appreciation of the world-wide situation concerning land distribution and the basic economic problems involved; and that such courses should be offered in the freshman or sophomore years—along with other basic subjects (Introduction to Business, Economic History, and Principles of Economics)—to every student of Business Administration.

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## ECONOMIC GEOGRAPHY LECTURE MATERIAL

ALEXANDER WARRINGTON

Loyola University, New Orleans

Raw materials and industrial operations thruout the world comprise a sizeable portion of most courses in economic geography, roughly from fifty to seventy per cent.

Lectures on raw materials and industrial operations are usually more effective if they are in the words of the industries themselves. This can be accomplished thru study of the many releases that emanate from the various factories, processing plants, and assembly stations thruout the United States and the world.

But a word of caution is in order so that hopeless confusion will be prevented. A standard textbook must be adopted in any economic geography course, and the lecture material must be attuned to the textbook order of presentation.

Let us analyze briefly some of the material available from the industries and which can be used to good advantage in preparing lectures.

*The Story of Blue Coal*, The Delaware Lackawanna and Western Coal Company, 120 Broadway, New York. The application of this study to economic geography may be appreciated by noting the following subjects: the earth two billion years ago; era beginning with the creation of man; Marco Polo; and anthracite and the Revolution.

*Petroleum Facts and Figures*, an annual publication of the American Petroleum Institute, New York, is one of the best statistical publications on the subject, which can be supplemented with numerous other releases for lecture fluidity. Students are always interested in reserves and *Proved Reserves of Crude Oil, Natural Gas Liquids*, and *Natural Gas* will supply this information. It is a joint publication of the American Gas Association, New York, and the American Petroleum Institute.

The American Iron and Steel Institute, New York, has an excellent booklet, *The Picture Story of Steel*. The table of contents is somewhat lengthy to repeat here; so we will generalize: technology, classification of steel consumers, and categorical breakdowns.

The non-ferrous list contains hundreds of interesting and very informative pamphlets and booklets available. *The History of Copper and Brass*, Copper and Brass Research Association, New York, can be used in the college class room. *The Zinc Industry*, The American Zinc Institute, New York, presents the early history of zinc, uses and production. As an example of new technology: *The Best Joint Designs for Silver Alloy Brazing*, Handy and Harman, New York.

Some of the publications of The Cleveland Quarries Company, Cleveland, Ohio are arranged in files and the illustrations are in beautiful colors. *History of Glass*, American Glassware Association, New York, presents a very good composite history of this important material. Many other publications could be listed on the organic and inorganic building materials.

Metal fabrication is such a vast subject that it has been handled by the professor in a manner best suited to convey a basic theme. *Industry-Research Conference*, Agricultural Research Center, Beltsville, Maryland is a good approach to material on a seminar level. *100 Million Motor Vehicles*, Automobile Manufacturers Association, Detroit, presents basic statistical information in a lively style with numerous photographs. *Prize Bridges*, American Institute of Steel Construction, Inc., New York, is one of the best releases available on this subject; and an understandable treatment of railroads will be found in *A Practical Evaluation of Railroad Motive Power*, Steam Locomotive Research Institute, Inc., New York.

General considerations of the forest industries of the world and the United States with more detailed treatment of the area in which the university happens to be located accomplishes most of the aims of economic geography. *The Southern Hardwoods*, Southern Hard-

wood Association, Inc., Memphis, gives a good descriptive enumeration of the more important commercial timber crop. As to policy—a subject that is receiving more and more attention—we mention: *Forest Conservation Policy Statement*, Southern Pine Association, New Orleans.

*The Story of Corn and Its Products*, Corn Industries Research Foundation, New York, may be used as an introduction to agricultural economics. The National Farm Chemurgic Council, Inc., New York, approaches the entire problem of economics and geography in the following manner: A—New, non-food uses for farm crops and their residues and by-products; B—New and profitable uses for previously unused plant materials; C—New Crops that farmers may grow profitably; D—More valuable uses for presently used crops thru chemurgic upgrading.

The professor in economic geography will be expected to interpret more and more the relationships between: Patterns of Soil, Climate, and Vegetation. The studies enumerated in the above paragraph would be a very definite step in the right direction, and all of the reports mentioned in this article have that objective in mind. Properly presenting economic geography involves a great deal more than casual acquaintance with textbook material.

On the cereal list, wheat is the logical starting point, and the introduction might be economic history. The Wheat Flour Institute, Chicago, handles the subject adequately. American Feed Manufacturers Association, Chicago, publishes a great deal of factual material in a succinct style.

Fruits and vegetables are pertinent to the "pattern discussions" already mentioned. The Giannini Foundation of Agricultural Economics has worked closely with the University of California and has studies available that deserve attention. *The Story of the Banana*, United Fruit Company widens our understanding not only of the banana, but of the whole field of agricultural economics. Scholarly studies have been released by the American Institute of Food Distribution, Inc., New York.

*The Story of Tea*, American Education Press, New York, gives us both an historical and economic review. It would be difficult to find a better treatment of the spices than in: *A Manual of Spices*, American Spice Trade Association, Inc., New York.

A minimum of fifty minutes is devoted in most economic geography courses on meat. *Meat Packing*, American Meat Industries,

Chicago, will supply the essential data. Related materials, such as milk, can be discussed on university level by using releases of the National Dairy Council, Chicago.

*The Romance of Leather*, Tanners' Council of America, New York, should receive some kind of acclamation; and the same thing can be said of *Crude Rubber*, The Rubber Manufacturers's Association, Inc.

Industry has made tremendous contributions to the whole field of higher education and particularly in those fields that we associate with economic geography.

Here is a partial quotation from a letter received by the writer from Alfred P. Sloan, Jr.: "... I feel very strongly that the University should be better supported by industry. . . . Likewise that those concerned with education should know the problems of industry more intimately than they do. Progress can be stimulated by both approaches."

There can be no doubt about this, but the problem is how? The most logical answer to that question is in studying and using the publications of the industries and the trade associations as soon after their release as possible.

#### INTERPRETING CURRENT PROBLEMS

We now come to a more difficult phase in the handling of economic geography and that is in the realm of interpretation of current problems. Here there is the danger of biased opinions being passed on to the students. The instructor who does not have some very strong opinions and convictions would be very rare; and yet it is desirable to avoid, as much as possible, being branded as either a liberal or a conservative.

After all, the chief mission is to give information as impartially as possible and permit the students to develop their own views; this, it seems, should be the objective of higher education.

People of recognition are often asked to speak before universities, on the radio, and at important functions. It is amazing how often these talks are pertinent to a problem worthy of class time. Ordinarily, copies of these talks may be procured in sufficient numbers so that every student may receive a copy. Reading these talks by the students, while the rest are following their printed copy is a good approach to the handling of current topics and interpretations. It tends to greatly stimulate interest in the whole subject.

## VISUAL AIDS

A word is in order on visual aids. A lecture on principal cereals can be greatly dramatized by such wonderful pictorial aids as those supplied by the Corn Research Foundation, New York, and the Millers' National Federation.

Visual aids need not be restricted to charts, graphs, and diagrams. The paintings of W. Langdon Kihn on Eskimo life, reproduced in the *National Geographic*, greatly stimulate attention to lectures on the Eskimo, the tundra and taiga.

National and international considerations ordinarily will make up the bulk of the syllabus. But some time would be spent to good advantage on the area where the university is located. Local area treatment serves a twofold purpose: better understanding of the area itself, and more pertinent illustrations of the subject as a whole.

Local chambers of commerce and trade associations are usually able to furnish the desired information. Then, too, there is a very distinct advantage in working with agencies of this character.

How can all this be accomplished? The biggest job is establishing all the contacts necessary, and this really takes several years. But as the information begins to trickle in, it can be used currently or set up for the next semester. The facts are relatively simple: the load on the professor in properly teaching economic geography is always much heavier than on the students; and the results obtained under a system of this kind certainly justify a rather considerable effort.

## CHANGING ATTITUDES WITH DIFFERENT METHODS OF TEACHING GEOGRAPHY IN A TEACHER EDUCATION INSTITUTION\*

HERBERT VENT

Southern Oregon College of Education, Ashland

An attempt was made to determine experimentally which of four teaching methods was best for teaching attitudes of social adjustment to students of college geography. The teaching methods used were (1) the group-project, (2) the lecture-outline, (3) the lecture-textbook, and (4) the individual study unit. Areas of social adjustment were (1) human understanding, (2) civic responsibility, and (3) world-mindedness, all operationally defined.

A survey of previous research indicated that little work had been done in methodology in geography. Some did relate to pupil gain, but had not dealt specifically with measurement of social attitudes by valid measuring instruments.

In the experiment four classes in a college geography department constituted the control group. Those taught by the group-project method consisted of seventeen upper division and graduate students; those taught by the lecture-outline method consisted of twelve upper division students; the group taught by the lecture-text-book method was made up of seven sophomores, juniors, and seniors; and the group taught by the individual study unit method consisted of twenty-six freshmen and sophomores.

The first problem was developing a test to detect changes in attitudes. The procedure used was a projective technique in which film strips dealing with the adjustment areas were shown at the beginning of the study and again at the end of eight weeks. All students in the four control groups saw the pictures both times. However, no commentary or writing explained them to the students. They, after seeing a film strip, wrote legends from the impressions left in their minds. The legends were compared with commentaries accompanying the films and were also carefully studied for responses that were of the nature of fantasies revealing covert and unconscious complexes. The responses were validated by means of personal interviews and the Bell Adjustment Inventory. With the latter there was a coefficient of correlation of .52 for the human understanding test;

\* Abstract of a research study conducted at Chico State College for a doctorate at Stanford University.

.46 for the civic responsibility test; and .01 for the world-mindedness test. Personal interviews indicated that the world-mindedness test did not measure behavior measured by the Bell Adjustment Inventory.

From the initial test it was found that women scored better than men in the area of human understanding, and men scored better than women in civic responsibility. There was no significant difference in world-mindedness. Students with previous work in education scored higher in world-mindedness than those having previous work in geography. Intelligence was statistically shown to have no significance in the satisfactory and unsatisfactory ratings assigned to students.

The follow-up test of attitudes indicated that decided gains occurred in human understanding and world-mindedness. No appreciable gain was detected in civic responsibility. There was little difference in the standing of the sexes in human understanding as revealed in the final test. However, it does appear promising in view of the findings of this study that other adjustment attitudes besides human understanding and world-mindedness can be successfully taught and measured in geography courses. It must be understood, tho, that much additional research is needed to validate the procedure.

The lecture-textbook method brought about the greatest change in the mean scores during the course of the experiment; it was followed by the group-project, individual study unit, and the lecture-outline methods. The group-project method was nearly as good as the lecture-textbook method, but the lecture-outline method brought about almost no change in attitudes.

That geography students rated less satisfactory in world-mindedness than education students was evidence that geographers have not been as successful as their claims indicate in teaching attitudes and appreciations. This appears to indicate a need for geographers to more carefully set up their objectives in terms of socially accepted behavioral patterns and to constantly evaluate their programs to determine the success of their instruction. Additional experimentation must be made in the area of teaching methods in college geography. Also further refinement of attitude tests is needed to better measure social learnings.

## GEOGRAPHY AND MUNICIPAL BOND ANALYSIS

LAWRENCE A. KRATZ

Dun and Bradstreet, Inc.

Geography is generally regarded as a cultural or avocational study practically devoid of mercenary or vocational utility. It is true that few professional people are full-time geographers, but many of them have to be part-time geographers. A knowledge of geography is either desirable or indispensable in many occupations commonly supposed to be unrelated to geography. One such occupation is municipal bond analysis.

What is municipal bond analysis, and why must a municipal bond analyst know geography? In the jargon of finance, a municipal bond is any bond issued, not only by a city, but also by a state, a county, a district (such as a school, irrigation, drainage, mosquito-abatement, or road-construction district), an authority (such as a port or housing authority), or other sub-federal governmental unit. Most municipal bonds are purchased by wealthy investors, corporations, banks, insurance firms, large estates, trust companies, and institutions interested in a small, safe return, rather than a large risky one. Many of these investors consult municipal bond analysts, whose function is to write reports on the authority, willingness, and ability of communities to pay debts. In order properly to evaluate debt-bearing capacity, a municipal bond analyst must investigate numerous problems pertaining to the geography of a community. An incomplete, but suggestive list of such problems follows:

1. How large is the population? Other factors being equal, a community with a large population can support a heavier debt than one with a small population.

2. How high is the real income per capita? The debt-servicing capacity of a community depends on that of the average resident, which is a function of real income per capita.

3. Is the economy of the community specialized or diversified? Would the contraction of one large industry, or closely related group of industries seriously impair community income?

4. Is manufacturing an important source of community income? If so:

- a. To what extent are the manufacturing industries of the community affected by the business cycle? Are the principle manufactures luxury-goods, durable-goods, or producers-goods for which

demand is comparatively variable, or necessity-goods, perishable-goods, or consumers-goods for which demand is relatively stable? How much danger would there be of a debt-service default during a depression as a result of widespread industrial paralysis?

b. Is manufacturing liable to expand or contract in the future? Are new industries moving into the community? If not, are community improvement projects or basic economic developments underway which are liable to attract new industries? Are the old industries moving out? If not, are they remaining because the community is still a comparatively good place for them, or because of the cost of transplanting or abandoning buildings and equipment now in use? When present buildings and equipment have worn out or become obsolete, will the old industries move away?

5. Is agriculture an important source of community income? If so:

a. Does much farming take place on marginal land liable to be retired from cultivation during periods of low prices?

b. Are land use methods increasing, conserving, or reducing the productivity of the land?

c. Are droughts, frosts, insects, fungi, heat waves, or hailstorms serious and unpredictable menaces to farm income stability?

6. Is mining an important source of community income? If so:

a. What is the quantity and quality of its mineral reserves?

b. Will these reserves probably keep the mines in operation until after the community debt has been paid off?

7. Is lumbering an important source of community income? If so:

a. Are the forests being mined or farmed?

b. Is timber a permanent or a temporary resource?

Not only the analysts, but also the buyers and sellers of municipal bonds need to know geography in order to function effectively. Without some geographic background, it is difficult for buyers to understand municipal credit reports, or for sellers to direct attention to the geographic advantages of bond-issuing communities.

## THE NATIONAL COUNCIL AT WORK

The National Council of Geography Teachers will hold its 1950 meeting at the Edgewater Beach Hotel in Chicago on Friday and Saturday, November 24 and 25. The meeting will be a parallel session with the meeting of the Central Association of Science and Mathematics Teachers. There will, however, be two joint sessions, one on *Mathematical Geography* and one on *Conservation*. Each organization will have its own banquet on Friday evening, and there will be a mixer for members of both groups at the hotel immediately following the banquets. For reservations at the hotel write directly to the management, 5300 North Sheridan Road, Chicago.

### UNESCO Conference

The UNESCO Relations office of the Department of State, United States Government, asked the National Council of Geography Teachers and the National Council for the Social Studies to aid in drawing up a list of recommended delegates to the 1950 UNESCO conferences, one on the teaching of geography as an aid to world understanding—at McGill University, Montreal, Canada, from July 12 thru August 23—and the other on history textbooks—at Brussels, Belgium, thruout the same period. Certain definite qualifications were set up for the entire delegation; every effort was made to have this country represented by balanced delegations at the conferences. The undersigned was in Washington twice during the preliminary period, and conducted an extensive correspondence with teachers of geography all over the United States. The recommended list contained names of many qualified individuals. Final selection of the delegation was made by officials in Washington. These delegates and some fifty other persons were invited to a preliminary conference in early May. They were guests of the University of Illinois at this time. The final announcement of the American delegation was made in Washington on June 15, and consisted of the following:

Professor Zoe A. Thralls, Department of Geography, University of Pittsburgh

Professor Thomas F. Barton, Department of Geography, Indiana University

Sister Mary Ursula Hauk, R.S.M., Saint Columba's Convent, Johnstown, Pa.

Miss Marion H. Seibel, School 52, Buffalo 14, N.Y.

The delegation represents interests of geography from the elementary level thru the secondary and college levels, as well as the teacher-training interests of the field. The National Council looks forward to a report on the UNESCO Conference from this group in November.

### Publications

Professional Paper No. 10, A Bibliography on Lists of Maps, will be published shortly. The Council also has in preparation an Airways Map of the World. Dr. G. Etzel Percy, formerly geographer with Trans-World Airlines (TWA), undertook preparation of the map, and has brought his wide experience and knowledge to it; the Council is deeply indebted to him. Dr. Percy has now left the United States for an extended period, and Dr. Norman Carls, American University, Washington, D.C. has undertaken the early completion of the map.

LOYAL DURAND, JR.  
President

## EDITORIAL NOTES AND NEWS

DR. ESTHER ANDERSON of the University of Nebraska reports that the Nebraska Council of Geography Teachers has extensive plans for making the *Bulletin* better than it has ever been in the past. It has long been one of the outstanding publications issued by a state council. The new officers of the Nebraska Council are: John M. Moulton, Hastings College, Hastings, Nebraska, President; Alvin M. Johnson, Chadron State Teachers College, Chadron, Nebraska, Vice President; Miss Hildegard Perssons, Lincoln City Schools, Nebraska, Secretary-Treasurer; Miss Flora Dutcher, McCook Public Schools, and Miss Esther S. Anderson, University of Nebraska, Editor and Co-editor of the *Bulletin*; and Miss Esther Anderson, State Coordinator.

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JOHN L. TAYLOR, who has been working for his doctorate at Clark University, returned to active duty with the Navy on August 1. He will be stationed for three months on Chichi Jima in the Bonin Islands where he will conduct geographic research for the Navy and the Pacific Science Board of the National Research Council. In November he will return to Pearl Harbor where he will be Director of Civilian Education in the Trust Territory and attached to the Staff of the High Commissioner of the Trust Territory of the Pacific Islands.

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EDITH PUTMAN PARKER, University of Chicago, has been developing a new branch of systematic geography through a seminar in the *Geography of Education*. This seminar is offered for advanced graduate students. During 1948 and 1949, three doctoral dissertations and one master's thesis dealing with the geography of education were completed under her guidance. The four studies are "Educational Land Use in the River Forest-Oak Park Community" by Herbert H. Gross; "Educational Land Use in Lake County, Ohio" by Edna E. Eisen; "The Geography of Education in the Winnetka and Bridgeport Communities of Metropolitan Chicago," by Allen K. Philbrick; and "Educational Land Use in the Territory of Hawaii" by Minnie Lee Van Telburg. Miss Parker, recipient of the 1949 Distinguished Service Award in Geographic Education, is known most widely for her technical speciality, educational geography.

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During the first six months of 1950, the following six chapters of Gamma Theta Upsilon were established: Alpha Iota chapter, University of Oklahoma, Sponsor, Dr. John W. Morris; Alpha Kappa chapter, University of Virginia, Sponsor, Dr. Sidman P. Poole; Alpha Lambda, East Tennessee State College, Sponsor, Dr. Ruben L. Parsons; Alpha Mu, Milwaukee State Teachers College, Sponsor, Dr. Mary Jo Read; Alpha Nu, Kent State University, Sponsor, Dr. James R. Beck; Alpha Omicron chapter, Northwestern University, Sponsor, Dr. Clyde F. Kohn.

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Copies of the "Ruhr Area, Its Structure and Economic Importance" may be secured from the United States Department of Commerce for twenty cents each.

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DR. ALFRED J. WRIGHT, Ohio State University, taught at the University of Nebraska during the 1950 Summer Session.

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According to Dr. Joseph S. Davis, head of the Food Research Institute, Stanford University, California, we might have a population up to 300,000,000 by the year 2,000. Dr. Davis expresses his ideas in a pamphlet entitled "The Population Upsurge in the United States."

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DR. CHARLES C. COLBY, Visiting Professor of Geography at the University of Illinois during the past academic year, served as Visiting Professor at the University of California at Los Angeles during the Summer Term, 1950.

## GEOGRAPHICAL PUBLICATIONS

John E. Ivey, Jr., Nicholas J. Demerath, Woodrow W. Breland. **Building Atlanta's Future.** 305 pages. The University of North Carolina Press, Chapel Hill, 1948. \$3.50.

Theodore T. McCrosky, Charles A. Blessing, J. Ross McKeever. **Surging Cities.** 287 pages. Greater Boston Development Committee, Inc., Boston, Massachusetts, 1948.

These two books which were offered about the same time are striking evidence of the growing recognition being given by the public to the importance of urban planning in all its phases. Following the example set by pioneering Chicago some years ago when the noted Wacker Manual written for the public school students attracted nation-wide attention, Atlanta and Boston interests with the cooperation of their respective school authorities and public school teachers produced these highly commendable works.

Altho the topics which they cover are similar and both books are profusely illustrated with interesting photographs, sketches and charts, they stand out in great contrast with each other with respect to style of writing and consequent appeal. The story of Atlanta is lively and informal while that of Boston is rather matter of fact recording. These volumes would be worthwhile if for no other reason than their demonstration of how the treatment of a given subject must, on the one hand, make a strong appeal even to the most indifferent person, while on the other hand, it can be so discussed as to appeal essentially only to those who have already developed a special interest.

The objectives of these books is well expressed in the words of the Preface to the Atlanta publication:—" . . . to know Atlanta's people, what they do, how they live together, and how they work together—how people cooperate to build a city." Both emphasize the vital importance of making cities livable for all classes of their population. The Boston story is somewhat the more comprehensive so far as the principles and elements of planning are concerned. It introduces more of the history of planning and considers in greater detail what has been done in other centers. But both deal with essentially the same topics including in addition to the significance of planning, the history, geography, sociology and economics of city growth both areally and down thru the years. Regionalism is by no means overlooked; human relations in their various ramifications are given prominence.

Illustrations are so numerous that both books would succeed in telling much of their respective stories were there no text. Both include bibliographies, the Boston list somewhat broader than the Atlanta. The Boston book contains a Glossary of terms and the Atlanta story, a series of questions at the end of each chapter. The Boston volume specifically states it is intended for secondary school students; the Atlanta authors do not make this matter clear. Presumably it could be used in either Junior or Senior high school.

Altho neither publication is stamped as a geographic work, both are largely geographical. Much of the world still needs to develop an awareness of the geographical when they write or speak in this field and to discontinue confusing the latter with sociological, economic, historical and other realms of knowledge.

*Building Atlanta's Future* and *Surging Cities* are important contributions to the field of urbanism and should give young people a lively awareness of the meaning and value of urban planning. May these books be read widely not only in the cities for which they are intended but elsewhere.

Ohio State University

EUGENE VAN CLEEF

**Barr, Jones, Delaney, Cutright, Charters. Our Friends in South America.** 418 pp. 28 maps and charts. The Macmillan Company, New York. 1950. \$2.48.

The five authors of this volume have achieved with distinction the difficult task of presenting complex and mature concepts in international relations in a form suited to the sixth-grade level, and interesting even to high school classes in beginning Spanish and geography. Their theme, consonant with their purpose to increase friendly inter-American relations, is set forth simply: "We cannot understand the people of South America, or of any part of the world, unless we know something about the geography and history of their land." This theme is elaborated comprehensively in four sections. Part I develops it chiefly from the standpoint of geography. It delineates the major physical and climatic regions of the continent, and with each, gives examples of how natural environment furnishes the stage for a variety of types of occupation and ways of thinking, and, also, handicaps, in some areas, progress in modern living. Part III provides an "up to the minute" account of production and the commerce of South America, stressing the hazards of dependence upon a one- or two-product economy. The remaining sections show how history, including current inter-American relations, conditions, cultural patterns and political inter-state attitudes. Here, understanding by young readers would be aided by greater recognition of the geographic factors established earlier in the book. Also, in the interest of developing initial, objective concepts among youthful "internationalists," the assumption that further education of Latin-Americans need not bring, necessarily or desirably, full conformity to the modern Anglo-Saxon norms of the United States, merits increased emphasis. The content of the text is richly enhanced by relief maps, altitude sections, pictures, bibliography, and a variety of worthwhile suggested activities. This is a volume which the thoughtful teacher will be happy to place in the hands of young people.

*Kelly High School, Chicago*

KATHARINE CALLOWAY

**Louis Bromfield. Out of the Earth.** 305 pages, 41 pictures. Harper and Brothers, 1950. \$4.00.

This is an exciting book.

Louis Bromfield brings up to date the story of Malabar Farm in southeastern Ohio, giving us the best case study we have of a conservational farm.

But this book is more than a case study. Using his farm as a spring board, Bromfield dives off into a sea of ideas of concern to the conservationist as well as to the practical farmer: the restoration of wornout land, the effect of tillage on the land, the mixing of growing crops, the resistance of well-fed plants and animals to disease, the conservation of water on the farm, rough fitting of land, using deep-rooted plants to feed on the sub-soil, significance of trace elements, the role of organic matter in the soil, price-control measures as perpetuating destructive land use, and grass farming.

As tho this were not enough in one book, he treats his readers with spirited essays on the Muskingum flood control project; opportunities in the South for ambitious, competent farmers; the relation of good hunting to good land; advice to makers of farm machinery; speculations on whether the world can feed itself; and a chapter on education, in which he pleads for teachers who can "spark" the minds of learners into flame.

If this book fails to stir the reader to greater enthusiasm for better use of the good earth, its shower of sparks is clearly falling on wet tinder.

*George Peabody College for Teachers*

J. RUSSELL WHITAKER

# The JOURNAL of GEOGRAPHY

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VOLUME XLIX

OCTOBER, 1950

NUMBER 7

## CHICAGO'S COAL: ITS ORIGIN, MOVEMENT TO MARKET, AND USE<sup>1</sup>

ARTHUR H. DOERR

Northwestern University

The origin of the Chicago coal supply, movement of coal to market, and the use to which it is put upon arrival presents a very complex and interesting problem. This paper attempts to analyze in a general way the various geographic implications related to the acquisition and transport of coal to Chicago and the use to which the coal is put upon arrival.

The Chicago area as delimited in this paper includes: in addition to the city Chicago, Elmhurst, Blue Island, Calumet City, Whiting, Indiana Harbor, and other suburban cities and towns of Indiana and Illinois (Fig. 1).<sup>2</sup> This area with its more than 4,000,000 inhabitants and multiplicity of industrial and commercial establishments is probably the largest urban coal market in the world.

The more than 25,000,000 tons of coal consumed annually in the Chicago area is produced in several places, and moves to market over a myriad number of routes by several different types of carrier.<sup>3</sup> This vast quantity of coal is used for a multitude of purposes upon its arrival at destination.

<sup>1</sup>Field work which included reconnaissance and interviewing was done in the Spring of 1949. This paper is a revision of a seminar paper written under the direction of Dr. Malcolm Proudfoot at Northwestern University in the Spring of 1949.

<sup>2</sup>The Chicago Switching District was chosen as the study area because it is the only unit relating to the Chicago area for which accurate statistics are available.

<sup>3</sup>Tonnage figures based on average figures for 1944 to 1946 from Columbus R. Gentile and Joseph J. Gallagher, *Bituminous Coal Distribution by Market Areas, Calendar Year 1944, Year Ended Sept. 30, 1945, and Coal Year 1945-46*, Mineral Market Report, M.M.S. No. 1500, Mineral Industry Surveys, U. S. Dept. of the Interior, Bureau of Mines, March, 1947, pp. 17, 77, and 139.

## ORIGIN OF THE COAL SUPPLY

All of the coal used in this area is produced east of the Mississippi River. Only the Appalachian and the Eastern Interior coal fields supply coal to Chicago (Fig. 2). The following states send coal to Chicago: Illinois, Kentucky, Indiana, Ohio, West Virginia, Virginia, and Pennsylvania. Of these, Illinois supplies between 25 and 30 per cent of the total amount, West Virginia is second with

about 20 per cent of the total, and Kentucky is in third place with from 15 to 20 per cent of the total. It is striking to note that the great coal producing state of Pennsylvania supplies less than 1 per cent of the coal shipped to the Chicago area. (For tonnage flow see Fig. 3.)

All but a minute amount of the coal consumed is of the bituminous variety, but a small amount of anthracite moves in from eastern Pennsylvania.

Several factors have influenced the present orientation of the Chicago coal market. The large amounts of Illinois coals that are used reflect the cheapness of coal produced in the Eastern Interior Field as opposed to

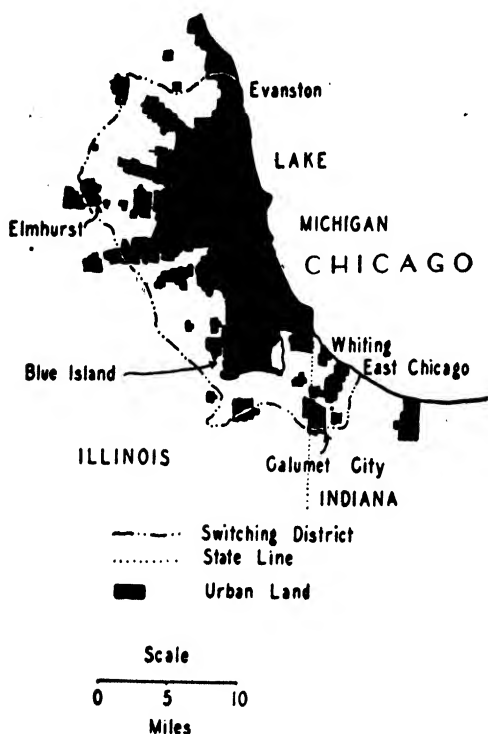


FIG. 1. The Chicago area.

the greater expense involved in obtaining coals from the Appalachian field. The medium to low rank coal obtained from Illinois, Indiana, and western Kentucky is satisfactory for steam generation and most other industrial purposes. It is not satisfactory for metallurgical coke, however, when used alone, and this is, in part, the reason for the large importation of high rank Appalachian coals.

West Virginia and eastern Kentucky supply most of the coking coal. In addition, large amounts of high rank coal go into domestic

channels because of its higher quality which results in lower ash content, higher heating capacity per unit of weight, and semi-smokeless qualities.

As has been mentioned, Pennsylvania coal is practically eliminated from the Chicago market. Several factors enter into this rather peculiar absence of Pennsylvania coals from this area. One very important factor is the length of time which Pennsylvania has been producing coal. As a result most of the Pennsylvania markets were well established before Chicago became an important market for coal. In addition, the large industries located within, and adjacent to, Pennsylvania consume tremendous amounts of coal, and reduce the amount of coal which would otherwise be available for other markets such as Chicago. On the other hand, West Virginia and eastern Kentucky were able to break into the Chicago market because of industry's demand for a high grade coking coal and consumer demand for better domestic coal. The late start of these areas as mining centers naturally helped channel their business away from eastern markets, which were largely under the control of the Pennsylvania mining districts.

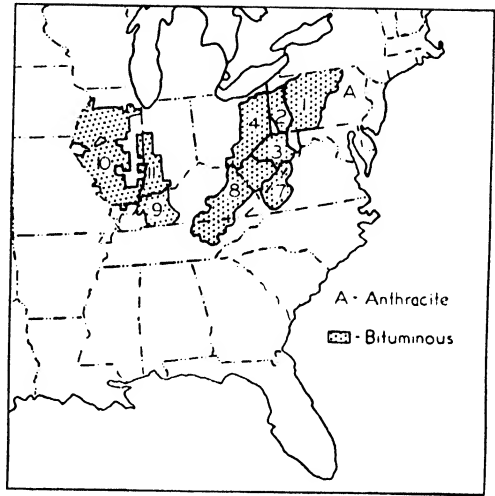


FIG. 2. Source of Chicago's coal. Numbered districts as set forth by Bituminous Coal Act of 1939.

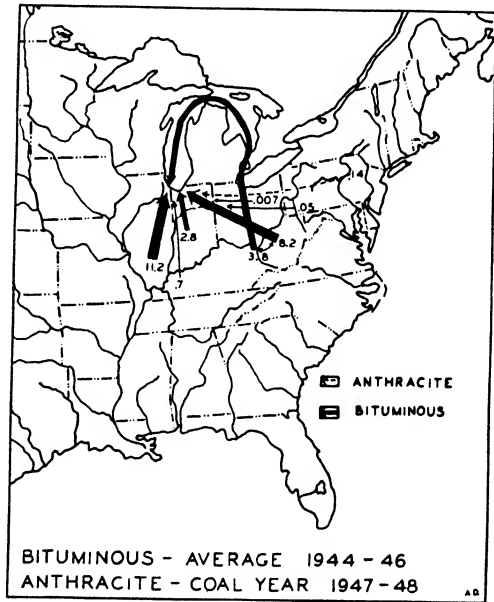


FIG. 3. Movement of coal to Chicago in millions of tons.

## MOVEMENT OF COAL TO MARKET

Chicago is advantageously situated to receive coal from all its supplying centers. The transportation of 25,000,000 tons of coal to the Chicago area each year is a stupendous task. Chicago, the largest railroad center in the United States, has the added advantage of being located on Lake Michigan and being connected to the Inland Waterways system. Present transport facilities are generally excellent and many proposed improvement schemes introduce the possibility of even better transportation facilities. Since coal is a bulky, low value product, this good transportation network is favorable for supplying the Chicago coal market.

Altho water transportation is important in the movement of coal to the Chicago market, far more coal moves to Chicago by rail transport than by water and trucking combined.

Most of the coal which is obtained from the Eastern Interior Field (Illinois, Indiana, and western Kentucky) moves to market by rail. Two factors have influenced the dependence upon rail carriers in this area; they are: the relatively short distances which are involved, and the lack of a superior waterway system. Recently, however, there has been an increased use of the Illinois River Waterway and its canal connection with Chicago. The tonnage carried on the Illinois Waterway has increased from slightly less than 2,000,000 tons in 1940 to almost 4,000,000 tons in 1947.<sup>4</sup> If increased widening and deepening projects are carried thru, it seems probable that an increased use will be made of this waterway.

Coals produced in the Appalachian Field are in an area where water transport and rail transport are in more direct competition. Of the coal which is shipped from eastern Kentucky, West Virginia, and Virginia, Chicago seems to be on or near the competitive boundary between coals shipped by an all rail haul, and those which are shipped by a combination rail-lake haul.

All of the coal shipped from the Appalachian Field is of high grade and is used for coke and by-products as well as domestic fuel. Most of the coking coal is used in the Lake Calumet industrial district of South Chicago. Most of this coal moves to market via the Great Lakes; only an insignificant amount of coking coal from

<sup>4</sup>Tonnage figures were obtained in the office of the Illinois Coal Operators Association, and were based on United States Corps of Engineers figures. Other figures checked do not agree specifically with these, but all the figures checked indicated the same rising trend from 1940 to 1947.

the Appalachian Field is carried into this area by a rail haul. Obviously it is cheaper to move coking coal over the Great Lakes route than by rail haulage.

In contrast to the 3,500,000 tons of coking coal shipped into the Chicago area by a combination rail-lake haul, less than 50,000 tons of domestic coal moves over the Great Lakes route. The most important reason for the relative lack of domestic coal shipped in this manner is the extreme degradation which the coal undergoes on the lake haul. Transfer from the rail cars to lake steamer at one of the Lake Erie ports, and then into dumps at Chicago results in much breakage of coal. Since it is desirable to maintain domestic coal sizes to improve its saleability and maintain its value, it becomes obvious that the degradation inflicted on the lake route restricts the amount of domestic coal shipped in this way. On the contrary, this degradation has no effect on the coking coal since it is composed primarily of coal screenings.

Another important factor enters into this consideration; most of the retail coal yards are located away from the lake front. This being the case, any coal carried by lake vessel would have to be loaded on truck or train to be carried to one of the outlying retail coal yards. This would, of course, result in additional degradation as well as additional cost.

The most obvious and perhaps the most influential factor, however, is the fact that the peak season for use of domestic coal is during the slack season of Great Lakes transport.

As has been previously mentioned, most of the coal used in the Chicago area comes from Illinois. A brief look at the freight rates will soon explain why.<sup>5</sup> Coals shipped from the Eastern Interior

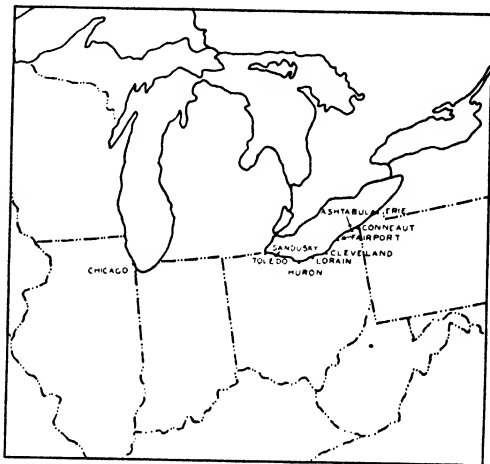


FIG. 4. Ports shipping coal to Chicago.

<sup>5</sup> Walter H. Voskuil, Douglas F. Stevens, and Nina T. Hamrick, *Illinois Mineral Industry in 1945*, Report of Investigations No. 121, Ill. Geol. Sur., Urbana, Ill., 1946, pp. 46-47.

Field (Illinois, Indiana, and western Kentucky) cost from \$1.65 to \$2.30 per ton to ship by rail. Coals shipped from West Virginia and eastern Kentucky bear a freight charge of from \$3.19 to \$3.39 per ton. Anthracite shipped from eastern Pennsylvania costs about \$4.26 per ton to ship. Thus it can be seen that coal produced in the Eastern Interior Field costs about \$1.00 per ton less to ship than the coals from the east. Coals shipped by a combination rail-lake haul cost about fifty cents more on the ton to ship than those shipped by an all rail haul from Illinois, Indiana, and western Kentucky. These lower freight rates coupled with the fact that coals produced in the Eastern Interior Field are usually of lower value than those produced in the Appalachian Field account for the use of coal from the midwest where feasible. It seems safe to assume that almost no coal would be purchased from the Appalachian Field if it did not possess such excellent qualities.

Several carriers share in the distribution of coal which is shipped into Chicago. The most important carriers are railroads. More than 20,000,000 tons of coal are shipped into the Chicago area by rail every year.

The most important railroads moving coal from Illinois, Indiana, and western Kentucky are: Illinois Central; Central and Eastern Illinois; Alton; Atchison, Topeka and Santa Fe, Chicago, Burlington and Quincy; Minneapolis, St. Paul and Pacific; and the Louisville and Nashville. From West Virginia, Virginia, eastern Kentucky, and Ohio most of the coal moves to market on the following railroads: Chesapeake and Ohio; Pennsylvania; New York Central; Baltimore and Ohio; and Norfolk and Western. Most of the coal carried from this area for transfer to lake vessels is carried on the New York Central, and the Baltimore and Ohio. Several lake ports such as: Erie, Conneaut, Ashtabula, Sandusky, and others then ship their coal to upper lake ports including Chicago.

Trucks deliver an insignificant amount of coal to the Chicago area, partially because of animosity they created in damaging roads.<sup>6</sup> Within the city, however, the trucks are important for moving coal from the yard to the consumer.

<sup>6</sup>Information received from Mr. Fred S. Wilkey, Secretary of the Illinois Coal Operator Association.

### USES OF COAL IN THE CHICAGO AREA

Coal is used for a wide variety of purposes in this large commercial and industrial center. About 10,000,000 to 12,000,000 tons of coal are used for industrial purposes annually in the Chicago area. Of the heavy users of coal public utilities, iron and steel, and cement manufacturing account for a large share.

Commonwealth Edison with its subsidiary companies consumed more than 9,000,000 tons of coal in 1948, which indicates the tremendous amount of coal used by public utility companies.

By-product coal for use in the manufacture of coke and water gas amounts to about 6,000,000 tons. Of this amount the Inland Steel Company alone uses almost 3,000,000 tons per year. It is also quite possible that some of the coal which is tagged as industrial coal is eventually coked.

About 9,000,000 tons of coal are distributed annually to the various retail coal dealers for supplying the various domestic and commercial needs.

Small amounts of bituminous coal are used for smithing and forging. Minor amounts of coal are stored or consigned for shipment to other areas.

Of the some 150,000 tons of anthracite coal shipped into the Chicago area by rail almost two-thirds of it was used for domestic purposes and the remaining one-third for steam power.

### FUTURE

Several factors might feasibly influence the supply of coal to the Chicago area within the next few years. One of the things which seems likely to significantly change the coal supply picture is the probability that larger amounts of lower rank coal from the Eastern Interior Field will be used in the manufacture of coke. Several factors have led to this situation.

The best of our coking coals are approaching depletion. In response to the demand for smokeless coals, the domestic heating market as well as coke manufacture is contributing to the exhaustion of low volatile coals, and the natural tendency to use the best first has resulted in the exploitation of the low sulfur high volatile coals by the coke industry.<sup>1</sup>

<sup>1</sup> Frank H. Reed, G. R. Yohe, O. W. Rees, and Harold W. Jackman, *Trends in Coal Utilization*, Circular No. 128, Urbana, Illinois, 1947. p. 15.

This very fact has resulted in the experimentation with lower rank coal such as that produced in the Eastern Interior Field for use as metallurgical coke. There has been some measure of success attendant with these experimentations; in fact, at the present time coals from the Eastern Interior Field are being used in amounts ranging from 10 per cent to 30 per cent of the total amount of coke produced in the Chicago area. With increasing amounts of coal being used from the Eastern Interior Field, it seems quite likely that the Appalachian producers will have to seek new markets to compensate for such potential market losses.

Several other factors could feasibly influence the future orientation of the Chicago coal market. Among the more important of these is the possible improvement of waterways, such as the proposed St. Lawrence Waterway, the improvement of the Calumet Sag Channel, and the possible improvement of the Chicago River. A possible shift in orientation of the steel industry would greatly alter the coal supply picture of Chicago. Shifts to other fuels are, and will continue, to influence the coal market of Chicago. The possible new development of conveyor belts for carrying coal from the Appalachian Field to the shores of the Great Lakes might conceivably increase the amount of eastern coals which are purchased. Obviously the future cannot be accurately foretold because there are too many unknown quantities. Possibly, too, man's choice will counterbalance all the physical and economic considerations. It does seem highly probable, however, that the above mentioned factors will significantly influence any possible change in orientation of the Chicago coal market.

#### SUMMARY

The Chicago Area, which is the largest urban coal market in the world, obtains all its coal from either the Eastern Interior Coal Field or the Appalachian Field. Where possible, at the present time, coal is purchased from Illinois, Indiana, and western Kentucky, because of the cheapness of this fuel compared to that produced in the Appalachian Field. High quality coal from the east for use as coking coal and high grade domestic fuel gives West Virginia, eastern Kentucky, Ohio, and Virginia a considerable share of the Chicago coal market.

Railroads haul the overwhelming majority of the coal moving into Chicago, altho waterways (including both the Great Lakes Waterway and the Inland Waterway System) carry about 25 per cent of the 25,000,000 to 30,000,000 tons of coal used annually in the Chicago Area. Trucks carry an insignificant amount of coal into Chicago, but along with the Belt Line Railroads, they are important distributors of coal within the city.

Future developments might well change the orientation of the Chicago coal market. Altho these factors cannot be examined quantitatively, there seems to be a distinct trend towards the using of more coal from nearby locations and less from greater distances. Whether this trend continues depends in large part on technological developments, labor relations, the buyers of coal, and the people of Chicago themselves.

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## A MEXICAN PUEBLO IN TRANSITION<sup>1</sup>

RUTH HOFFMAN STANLEY

George Peabody College for Teachers

Mexico's agrarian reforms since the Revolution of 1910 have focused on the ejido program, that is, the breaking up of large estates and the redistribution of land to landless farmers. From 1911 to 1920, very little real headway was made toward accomplishing the objective. Following the election of Obregon, however, there was a marked increase in the amount of land restored to pueblos. Aided by new legislation in the thirties, the program of restoration continued to the extent that, by 1946, approximately one-fourth of Mexico's agricultural land, representing one-half of the crop land, was in the hands of recipients of land grants.<sup>2</sup>

The term ejido includes both the agrarian community which has received land and the land received in grant. Recipients of

<sup>1</sup> This article was written as a result of a summer's research in Mexico, made possible in part through a grant-in-aid allocated by a research committee of the Vanderbilt-Scarritt-Peabody University Center, from funds made available jointly by the Carnegie Foundation and the three colleges.

<sup>2</sup> Ana M. Gomez, "Mexican Agrarian Policy—Postwar Developments," *Foreign Agriculture*, Vol. XII, No. 10, Oct. 1948, 221.

plots, or parcels, of land are referred to as ejidatarios. These terms will be used repeatedly in this paper as there are no corresponding terms in English.

There are three grades of ejidos in Mexico, the rich, the poor, and the middle group. The rich ejidos are generally those on irrigated land, in which emphasis is placed on commercial crops. They are exemplified by the cotton producing areas of the dryer northern states. The poor ejidos, typical of those in the Valley of Mexico, are a result of too many people on too little land, much of which is relatively unproductive. Subsistence farming based on corn and frijoles on plots ranging in size from less than two acres to ten acres of land is the general rule. Many farmers in these ejidos are forced to work in factories or other enterprises in the city to supplement their meager income from the land. In the middle group of ejidos, more intensive commercial production, made possible thru better land or irrigation farming and better communication facilities, has resulted in a slightly higher level of living.

A poor ejido in the Valley of Mexico, suggested as typical by an official of the National Bank of Ejidal Credit, was studied in the field by the author during the summer of 1948 to see what changes, if any, had taken place within the villages as a result of the ejido program. San Pablo Atlazalpan in the Municipio of Chalco, State of Mexico, approximately twenty miles east and south of Mexico, D. F., was chosen for the study. This pueblo was built in the colonial period to house laborers on the Hacienda de la Asuncion. Following the Revolution and subsequent partition of the land the hacienda was reduced to 86 acres, now used for corn and dairy cattle. San Pablo is only one of several pueblos of the Chalco Zone that were formerly a part of the larger estate.

#### THE VILLAGE AND ITS SETTING

The village and surrounding cropland are located on the lacustrine plain of former Lake Chalco, an area of relatively fertile sandy loam soils. Low mountains rise abruptly from the plain and here and there, volcanic cinder cones break the monotony of the low relief. Trees on the mountain slopes have long been destroyed. Scrubby brushland and grasses on the lower slopes are used by the villagers for summer pasture and as a source of fuel.

San Pablo is laid out in a rectangular pattern of low, flat-roofed buildings behind contiguous adobe walls, and narrow mud roads.

During the summer rainy season mudholes are common in the streets. For a village of more than two thousand, the streets are startlingly empty. Intimate home life is now, as it has always been, well hidden from the casual observer. Wooden doors of recent construction in centuries-old walls mark the entrance into the inner courts toward which each residence is oriented. The absence of stucco or whitewash indicates the relative poverty of the village.

As in the past, public life of the village, including school and religious activities, is centered in the plaza or village square. In contrast to the drabness of the village streets, the plaza is colorful. A bandstand of rust and tan tile stands in the center. A lovely churchyard and Catholic church open on the square on the north side, and a newly whitewashed public building faces the plaza on the east side. A number of trees in the square add to its beauty and soften the glare of the noon-day sun. Within the past twenty years a Federal school building, one of two in the village, has been built on the south side of the square. The school buildings and the municipal building have both been built as a result of reforms following the Revolution. Municipal organization and the erecting of schools are not, however, confined to the ejidos.

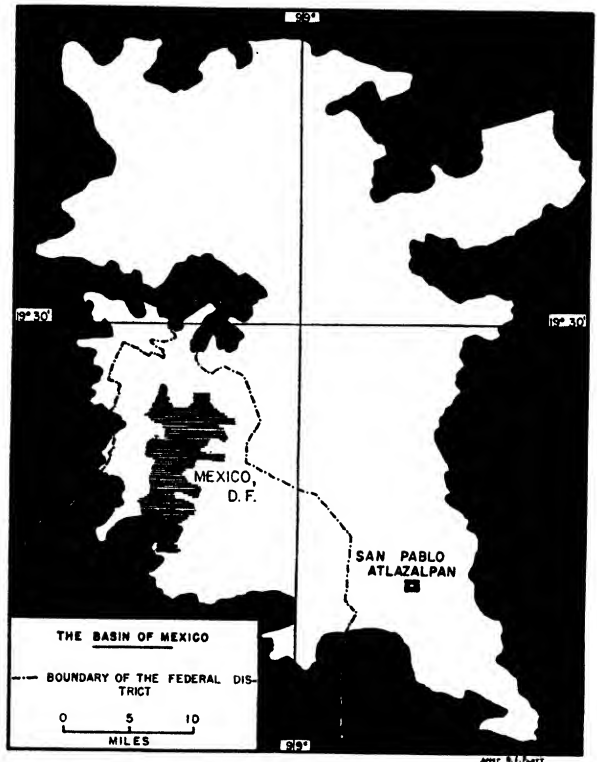


FIG. 1. Basin of Mexico.

#### ECONOMY OF THE VILLAGE

**Land Holdings.** San Pablo Atlazalpan, a pueblo of 2,700 people, received as ejidal land a total of 988 acres on May 17, 1925. Of the

725 family heads in the village, 440 farmers received ejidal parcels. Of this, approximately 632 acres are cultivated under temporal<sup>3</sup> farming and the rest is classed as cerril.<sup>4</sup>

The village owns land other than the ejidal grant. An additional 904 acres have been bought by various farmers in small plots from surrounding farms. The villagers own 1,729 acres of summer pasture and some 1,235 acres of mountain land not included in the grant. Communal land of the village totals 741 acres. This land added to the ejidal grant gives the village a total holding of approximately 5,597 acres. The average size of individual family holdings is, roughly, six acres.

**Bank of Ejidal Credit.** Much criticism has been made of the redistribution of the land to ejidatarios. Some people say that the individual Mexican farmer has no initiative, that he cannot make the land as productive on his own as it was under hacienda management, that the program of dividing the land equally among many farmers makes individual holdings too small and does not discriminate between good farmers and poor ones, and that ejidatarios do not have the money to operate land successfully.

In order to aid the farmers in overcoming the handicaps of poor land and small holdings, and to assist the ejidatarios in better management of the land, the Mexican government, in 1936, created the National Bank of Ejidal Credit. The bank operates thru agencies which are divided into zones. San Pablo Atlazalpan is a part of the Chalco Zone. The operating capital of the bank is obtained from three sources: sixty per cent is furnished by the Federal government; thirty per cent by the State government in which the Bank is located; and ten per cent by the ejidatarios themselves.

The Bank operates only thru local ejidal credit societies. In order to form a society and control the ejido, it is necessary to have a membership of fifty per cent plus one person of all the ejidatarios in a village. In San Pablo, 250 of the 440 ejidatarios belong to the local society. Local societies may obtain loans and equipment from the Bank. With the money thus obtained the farmers work the land. In the case of newly established ejidos the farmer, upon receipt of the land, is able to borrow money with which to buy animals (principally mules), implements, and seeds for the first planting.

<sup>3</sup> Dependent on summer rains for moisture without benefit of irrigation.

<sup>4</sup> Rough, mountainous land.

Subsistence money is usually supplied until the first crop is harvested.

Of more lasting significance, probably, than the initial loans is the work of the technical engineers of the Bank. Altho ejidal land is given only to those persons who have lived on the farms and have knowledge of the rudiments of land cultivation, implements and methods are primitive and wasteful of human energy and land resources. The technical engineers, all of whom are graduates of



FIG. 2. Cornfields separated by rows of trees or by dirt roads occupy all of the cropland around the village. The isolated mountain on the lake plain is a volcanic cinder cone. The cumulus clouds, rapidly becoming thunderheads, are typical in the summer. Much soil is lost from these corn fields during the violent showers that occur almost every afternoon in the rainy season.

the National School of Agriculture in Chapingo, State of Mexico, are teaching the farmers how to modify the old systems. The process will take a very long time. Most of the ejidatarios, predominantly Indian in culture, have had little or no education and, as laborers on a hacienda, have developed little initiative. Likewise, they see no reason for change. To a casual observer the thought occurs that many of the farmers regard the engineer as the new voice of authority replacing the hacienda owner rather than as an adviser. The engineers with whom the author worked are thoroly

competent and sympathetic. They recognize these deeply rooted obstacles and patiently work toward overcoming them little by little.

The following paragraphs on San Pablo Atlazalpan will serve to bring more clearly into focus the work of the Engineer of the Chalco Zone.

**Method of Cultivation.** The first plowing in the spring is done with a tractor owned by the Bank and operated by a driver hired thru the Bank. After the initial plowing continued care of the fields is in the hands of the ejidatarios. The only equipment owned by the ejidatarios is a steel plow pulled by mules or horses. Plowing continues until the corn is several feet high.

Virtually all of the cultivated land is in corn. Other crops are limited in San Pablo to frijoles and haba (varieties of beans). These products, where grown, are intercropped with the corn. Not once was a field devoted entirely to frijoles or haba observed by the author in July, 1948.

Little progress has been made in soil management or conservation education. No rotation is carried on, but compensation for this is made by the practice of planting trebol (a clover) after the last plowing prior to harvest. By the time the corn is ripened the trebol is approximately three feet high. After harvest the trebol is plowed under as green manure. This practice has been carried on for the past two years.

Nothing has actually been accomplished to prevent soil wash from the impact of heavy afternoon rains on newly plowed fields. However, one ejidatario was observed during an exceptionally heavy downpour piling mud across the mouth of a furrow at a corner of the field where a small rushing stream was cutting away the banks of the field. Very slowly, by encouragement of such practices, the engineers are teaching the farmers something of the urgency of caring for the land. But the imprint of centuries of farming in a traditional exploitive system fades very slowly.

The use of improved seed is taught by the engineer. Formerly it was customary to sell the best seed and plant that of poor quality. All of the teaching is informal by way of suggestions here and there in a friendly manner. In San Pablo, and the Chalco Zone in general, a feeling of friendliness and good fellowship prevails between the engineer and the leading ejidatarios.

**Disposal of the Harvest.** The percentage of maize grown for the market varies greatly from village to village. In most of the pueblos

of the Chalco Zone the farmers produce enough for subsistence but very little surplus to sell. In San Pablo, on the contrary, proximity to good markets in Chalco and in Mexico, D. F. results in the selling of sixty per cent of its maize crop. The maize is carried to market in the two trucks owned by the ejidatarios, and on burros. With the money received cheap clothes and other meager supplies are purchased.

**Relative Importance of Livestock.** In this pueblo of 2,700 people, comprising 725 families, there are 100 cattle, 260 goats, 200 sheep,

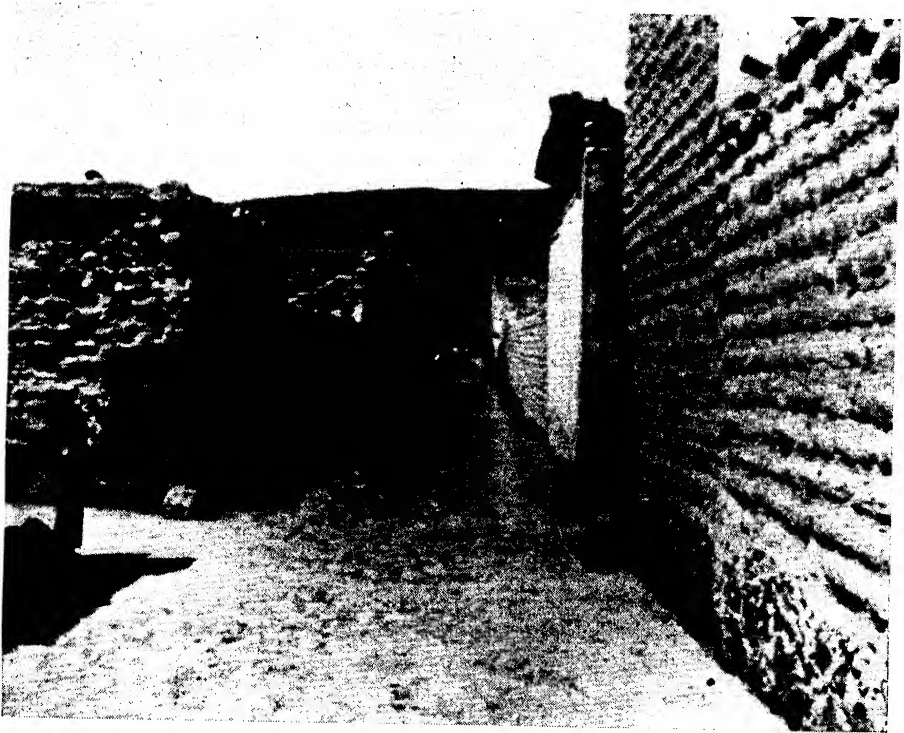


FIG. 3. A typical street scene in San Pablo Atlazalpan. Evidence of the poverty of the village is seen in the state of disrepair of the walls and the lack of stucco or whitewash.

2,000 pigs, 150 mules, 50 horses, and 4,500 turkeys, chickens, and ducks. With an average of one cow for every seven families, it is obvious that dairy products are insignificant in the daily diet. Milk is fed to children when they are ill. The poor quality of the cerril for pasture lands is possibly responsible in part for the small numbers of cattle. Pasture feed is supplemented by grasses gathered in swampy spots along the road.

The sale of pigs supplements the income from maize sales. A total average of less than three pigs per family indicates, however, that the additional income is slight. No provision is made in the village for scientific care of pigs. Every family raises some poultry for the market. Turkeys are particularly numerous in central Mexico.

**Diet.** The diet of the village people has probably changed very little, with the possible exception of fruits and rice that are

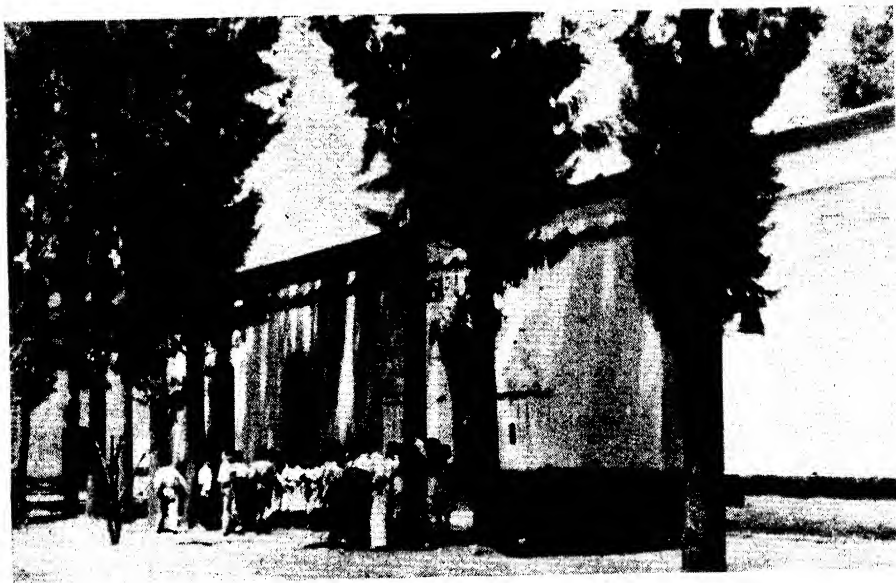


FIG. 4. The Federal school building on the south side of the square is typical of the many schools that have been built by the government since 1925. Room equipment and furnishings are meager in the schools.

available in the markets. The usual daily diet in San Pablo consists of tortillas; soup made of flour, boiled water, and beef or sheep; pork and sauce; vegetables of the area such as purslane, frijoles, and horse beans (haba). Very little chili is eaten. If a family has the money it is possible to buy bananas, rice, oranges, pineapples, sugar, and coffee, sweet corn, and tomatoes. There is no lack of variety in the foods grown in the area, or brought to the market center from other regions. In general, the people of San Pablo have sufficient food to eat altho the very low income and traditional taste precludes much purchasing of supplementary foods.

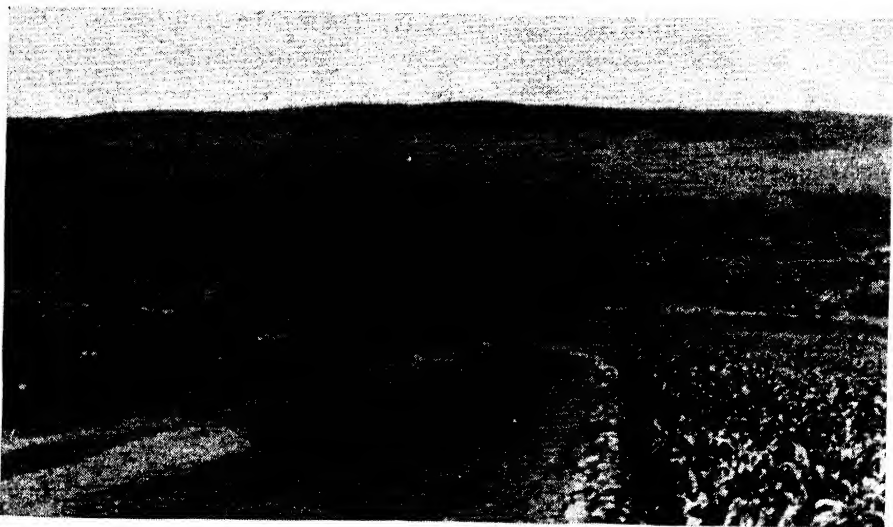


FIG. 5. All of the roads between pueblos in the Chalco Zone are dirt roads, and generally passable for cars. The mountain slope in the background is classed as cerril. Because it is poor pasture, animals are also grazed on grass along the roads.

#### SUMMARY

Prior to the redistribution of land the holdings of this village, at that time with a population of 1,127, totaled less than 3,000 acres, three-fourths of which was mountainous or summer pasture of poor quality, and the remaining fourth was communal crop land. Today, with its population more than doubled and village holdings of almost 5,600 acres, the average family owns approximately six acres including both cerril and cultivable land. More than fifty per cent of the family heads have received ejidal parcels. Ejidatarios organized a local society of ejidal credit, thereby becoming eligible for financial aid from the Bank of Ejidal Credit for the purchasing of equipment and seeds.

Today the ejidatarios have the benefit of expert technical advice from the trained agricultural engineer placed in charge of the local program. Slowly, thru his guidance, the farmers are acquiring improved methods of cultivation. The first spring plowing is now done with a tractor owned and operated by the Bank of Ejidal Credit and the farmers themselves own two trucks and steel plows. The use of better quality seed corn and the planting of trebol with the corn to provide a post-season green manure have both been introduced. Due to the proximity of the urban markets sixty per cent of the corn crop is sold.

Two schools and five teachers have been provided by the Federal government. Talented boys are given an opportunity to attend the National School of Agriculture.

Although beginnings have been made, the problem is far from a satisfactory solution. Individual land holdings are still too small to support a family on more than a subsistence level; yields are still unnecessarily low; techniques are essentially the same as before the Revolution. Practically no progress has been made in conservation of soil and water resources in the ejido. However, the changes listed are suggestive. Many years must pass before the total success of the program can be evaluated. Perhaps the most encouraging evidence of its ultimate success is the enthusiasm of the technical engineer in the field.

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## ALASKA AND THE ALASKA HIGHWAY

E. FRANKLIN FISHER

Thomas Carr Howe High School

The improved Alaska Highway, nicknamed the Alcan, has opened the gateway to opportunity for the geography teacher. Why not combine your plans for educational advancement and a wonderful vacation next summer? During the summer I helped deliver a school bus to Alaska.

August 8; just one week and 2,000 miles after leaving Indianapolis, we arrived at the Canadian Border and after clearing Canadian Customs felt that we were really "Alaska Bound."

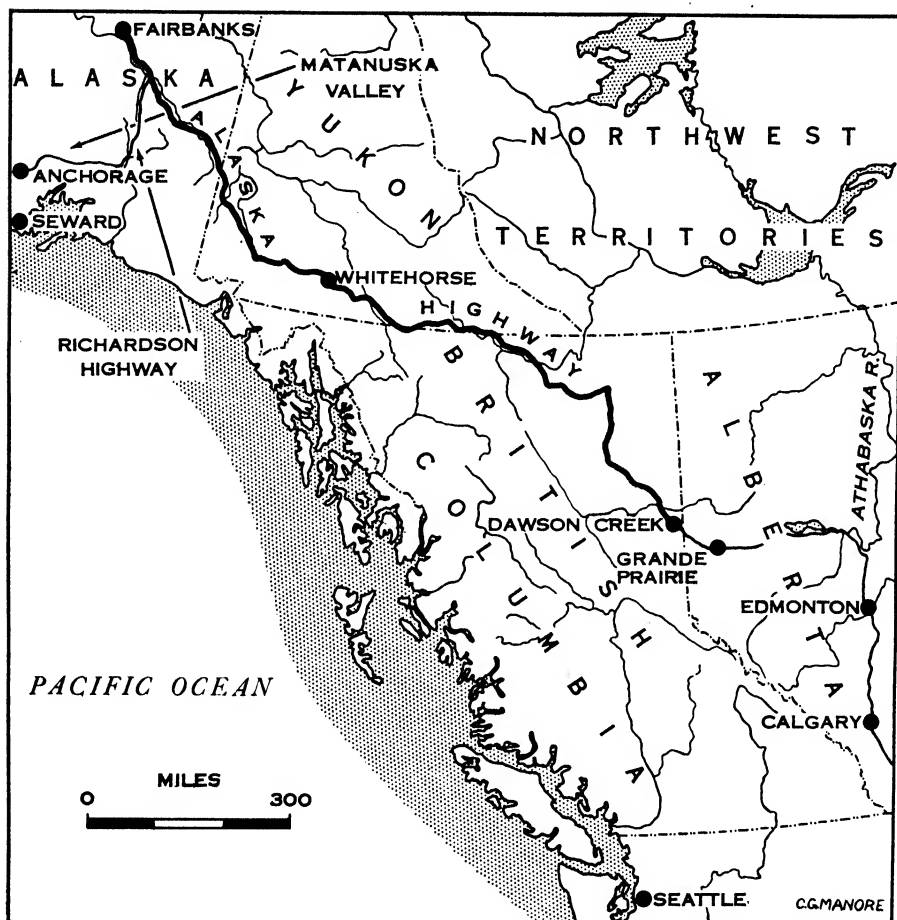
It was interesting to note that the fields of golden grain were being harvested in Montana as we left the United States. Driving past the fertile fields of Alberta, we found the unripened grain just beginning to turn a golden brown. Calgary is a thriving center of a great wheat producing and cattle raising area. At Edmonton, capital of Alberta, in addition to fertile agricultural lands, we found a district of large oil and coal deposits. Edmonton is also an industrial center with numerous manufacturing concerns.

### THE END OF A PERFECT DAY.

Travel regulations listed by motor clubs and travel agencies suggest that spare parts for your car should be carried for your convenience. In most instances however, you will find facilities for minor repairs every 200-300 miles along the highway, and gasoline

and oil are usually available every 50-75 miles. If you contemplate a trip up the Alaska Highway, have a steel plate welded around the bottom of your gas tank, to protect it from the rocks and stones. Remember that from Edmonton to Alaska, gasoline will cost from 32 to 66 cents per gallon!

Driving over the 431 miles of excellent black top and concrete



highways between Shelby, Montana and Edmonton, Alberta, will almost convince the traveler that the authors of those travel recommendations were pessimists. Driving conditions had been perfect—and now “to the end of a perfect day.” The hard surfaced road ends abruptly as you head north for Athabaska. This rich agricultural land along the tumbling Athabaska River is unsurpassed in scenic beauty.

### BRIDGE OUT

To the northwest of Athabaska, near Lesser Slave Lake, it started to rain as we saw a convoy of Canadian Army vehicles approaching us. For miles and miles the only vehicles we met, were those of the convoy.

At 12:10 p.m. on August 9, we lined up in back of several other cars and trucks and were informed that the bridge up the road had been washed away by the turbulent waters of a small stream. Walking down to the bridge, we learned that the crew expected to have the road open again in a day or two! The army convoy had opened a temporary road around the bridge, and of course they had priority on the one-way traffic lane.

About 2 p.m. an enterprising farmer appeared at the scene of the detour with an ancient tractor. As the last of the army vehicles were pulled thru we found that our good neighbor was willing to help us thru the 500-600 foot detour. However, when we found his assistance would cost \$35, we decided to wait until the highway department sent aid. At 9:20 p.m., a highway "Cat" tractor hooked on to the front of the bus, and we were pulled safely thru the detour.

### ALASKA HIGHWAY

From Edmonton to Dawson Creek, the road is gravel and dirt, with very little gravel where the road runs thru the fertile open prairie. We went thru High Prairie and entered Grande Prairie and were surprised to find a wide concrete pavement thru town. Here is the only paved street between Edmonton and Fairbanks. Near Grande Prairie at the small town of Beaverlodge, six elevators handle around a million bushels of golden grain annually.

The distant mountains become visible in the west as Dawson Creek is approached. In the center of town is Mile Zero on the Alaska Highway. The "ALCAN" at last, just 3,000 miles and 9 days away from Indianapolis.

The Alaska Highway from Mile Zero at Dawson Creek, British Columbia, Canada, to Fairbanks, Alaska, traverses 1,523 miles of the most scenic route imaginable. Its 1,221 miles in Canada and 302 miles in Alaska have been cut thru a wilderness area, and the road is an amazing feat of engineering skill. The highway was maintained as a military road by United States authorities until April 1, 1946 when it was turned over to Canada.

The country beyond Dawson Creek is heavily timbered, but

much of the land is flat. Cleared land produces fine crops of both wheat and oats. About 300 miles from Dawson Creek the route crosses the northerly extension of the Rocky Mountain Range at an elevation of 4,251 feet. There is some beautiful mountain scenery in this territory.

#### ALASKA

From Whitehorse north, the road follows an old trail passing beautiful 40-mile long Kluane Lake with its superb views. After entering Alaska, we followed the Tanana River, and at Tok Junction decided that we would go to Fairbanks. While in Fairbanks we visited America's northernmost university, the University of Alaska, which is three miles from the city, at College.

Fairbanks is an important gold mining and transportation center. The Alaska Highway and Alaska Railroad terminals are located here, and it is southern terminus for the Richardson Highway which runs south to Valdez. The city is an important air departure point, and daily flights can be made over the Arctic Circle during the summer months.

#### MATANUSKA VALLEY

Retracing part of our route from Fairbanks back to Big Delta, we started down the earliest unit in the Alaskan road system, the Richardson Highway. Then we proceeded over Glenn Highway from Glenn Allen to Palmer. The Palmer road was originally constructed to serve the fabulous Matanuska Valley. Many of the homesteaders sent to this colony from the States in 1935, are now prosperous farmers. Anchorage provides a ready market for the agricultural products of Palmer and Matanuska Valley. Potatoes, cabbage, beets, carrots and peas will soon be transported the 47 miles to Anchorage on an improved black top road which is wide enough for an airplane to land on in an emergency.

#### ANCHORAGE

Anchorage was built by the government in 1923 and is the "New York" of the North. It is the largest city in the territory and a transportation center for land, sea, and air travel. Fishing, farming, mining and fur marketing are all important to the economy of this thriving city. Fort Richardson is our most important northern defense. The local airfield is probably the busiest in Alaska and serves the Orient as well as Alaska and the States.

### FLYING DOWN TO SEWARD

At the present time there is no highway between Anchorage and Seward, altho a road is under construction. We decided to ship the bus by the Alaska Railroad and fly down to Seward, rather than wait until the regular passenger train went down, two days later. After making the necessary arrangements, we climbed into a plane of one of the veteran "bush pilots of Alaska." About 5 minutes out of Anchorage, the pilot pointed down to where a big black bear was climbing the mountain side. Later we saw 3 bears and 2 moose on the return trip. With the exception of 2 or 3 air pockets between the mountains, the flight was uneventful until we made the approach for landing at Seward. We bounced several times, due to the air currents, and then settled to the ground. As our plane was taxied up in front of the hangar, the left tire blew out. We climbed out and as I looked at the side of the plane, it was reassuring to know that we had been flying in a "Safeway Airline" plane!

### VACATIONLAND SUPREME

Starting point for any vacation on the Kenai Peninsula is the city of Seward, named for the great Secretary of State who arranged for the purchase of Alaska by the United States for \$7,200,000. Seward is deservedly the "most beautiful town in Alaska." It is built at the head of picturesque Resurrection Bay where Alexander Baranoff landed in 1792. It was from here that we visited the hunting, fishing and scenic paradise of Kenai. A few miles from Seward lies 20-mile long Kenai Lake. Along its shores you will find hiking, boating, swimming, horseback riding, trout, moose, bear and sheep. Here too, we visited "Alaska Nellie" at Lawing, Alaska. Her museum is one of Alaska's best. This 76 year-"young" pioneer will proudly show you the many animals she has killed and tell you interesting experiences of her 50 years in Alaska.

Cooper's Landing at the end of Kenai Lake is the center of big game hunting. Then, at Russian River Rendezvous, a lodge operated by a retired school teacher, we saw salmon fighting their way up Russian River to their spawning grounds.

### IT'S A SMALL WORLD

A few days later we drove over the Seward-Kenai Highway to the little fishing village of Kenai. During our visit to the Kenai

Territorial School, we learned that the superintendent and his wife had returned from summer school at Indiana State Teacher's College, Terre Haute, Indiana, the day before our visit.

At Naptown, Alaska, on the Seward-Kenai Highway, we stopped for coffee at a little lunch room and found an arrow pointing back toward Seward. The sign "Indianapolis—4,550 Miles" told more than George and Alex Petrovich and their wives would admit. Inside the lunch room, I was surprised again—to find a picture of their relative and my friend, Howard Longshore, an Arsenal Technical High School teacher of Indianapolis. This is truly ONE World, and a small world at that!

### TIME FOR SCHOOL

Winding back to Seward thru miles of the most majestic mountain scenery and some of the best hunting and fishing country on the continent made me realize that Alaska will have her magnificent beauty long after all her gold is gone. Once you know Alaska and her wonderful people you look forward to going back.

Alaska had been so wonderful that it was difficult to realize that our plane reservations were for tomorrow, August 23. It was time to leave the towering mountains surrounding beautiful Resurrection Bay.

We flew up to Anchorage in our "Safeway Airline" plane. Leaving Anchorage in a Northwest Airlines, 55 passenger DC-4 at 11:15 A.M., we arrived in Seattle at 6:35 P.M., Alaskan Time.

An uneventful trip by plane and train brought us to Shelby, Montana, where we loaded our baggage into my car and started for Indianapolis, arriving on August 27.

Ten thousand one hundred and eighty-six miles of travel in twenty-seven days is not recommended—so let's take the entire summer next year!

## GEOGRAPHY OF MANUFACTURING: WHAT IS IT?<sup>1</sup>

JOHN W. ALEXANDER

University of Wisconsin

"What is the connection between manufacturing and geography?" is a question which laymen frequently ask of geographers who are teaching or doing research in manufacturing. To members of the geographic profession this may seem like a useless question because to them the connection is perfectly clear. However, it is by no means clear to other people among whom there is a widely-held notion that geography deals only with landforms, climate, resources, and locations of cities and rivers. Consequently, little connection is seen between manufacturing and geography. There is ample evidence of this attitude at registration time on a university campus when numerous students, thinking of registering for "Geography of Manufacturing" seem puzzled and ask, "Just what do you do in a geography of manufacturing course?"<sup>2</sup> The same sort of question is encountered in field work when one interviews men in industry. They are inquisitive as to the reasons for the geographer's interest in their occupation, and they frequently ask, "So you are a geographer! What has geography got to do with manufacturing?" They understand why an economist or a representative of a school of commerce should be interested in manufacturing, but why should a geographer? What is the answer? Should a course on manufacturing be offered only in commerce schools and in departments of economics? Is geography overreaching its bounds, or should it be made clear to all that certain aspects of manufacturing occupy a logical position in geography?

Geography is the study of the regions of the earth's surface. Regions exist because "things" differ from place to place, and these things are of two types—"physical" and "cultural." Across the face of the earth these two types of elements are interwoven something like the warp and woof of a fabric—the physical strands

<sup>1</sup> The author gratefully acknowledges the contributions of Richard Hartshorne, Professor of Geography, University of Wisconsin and Clarence Olmstead, Assistant Professor of Geography, University of Wisconsin, in the formulation of many ideas contained in this article.

<sup>2</sup> The author has been confronted with this question countless times by students (from disciplines outside geography) who are interested in three credits in an elective course and happen to notice "Geography of Manufacturing" as they thumb through the timetable.

including climate, landforms, soils, vegetation, minerals, etc.; while the cultural strands include population, settlements, agriculture, mining, manufacturing,<sup>3</sup> etc. (Fig. 1). If one of these elements were distributed evenly over the earth in monotonous uniformity it would have no geographic aspect, but since there are regional differentiations for each, they are geographical elements. Since manufacturing does differ from place to place, it can be analyzed geographically and thus it qualifies as one of those elements which cause regions to be distinguishable on the earth.

		CULTURAL				
		Population	Settlement	Agriculture	Mining	Manufacturing
PHYSICAL	Climate					
	Landforms					
	Soils					
	Vegetation					
	Minerals					

FIGURE 1

In his consideration of the fabric of the earth's surface, the geographer can make his study in one of two ways. One way is to consider different sections of the fabric separately—the regional approach—in which *all* the strands are studied in their interrelationships in *one* region. A second way is to pull out *one* strand from the entire fabric and analyze it as it appears in *all* areas. Thus we have the several “systematic” branches of our discipline; physiographers extract the landform fiber, climatographers the climate strand, and others do likewise with other physical elements such as soils, vegetation, and minerals. Such a systematic approach to the cultural elements has not been so well-ordered because most of the extraction has been in handfuls of strands on the part of economic geographers who have spread their attention over the entire woof.

#### ANALYSIS OF MANUFACTURING

Since manufacturing is one of the cultural fibers which helps determine the character of a region it can be extracted for indi-

<sup>3</sup>To be sure, the analogy is not entirely appropriate because the woof is in part dependent on the warp of the geographical elements, nevertheless there is this close interconnection between the two distinctly different types of elements.

vidual analysis. How will a geographer handle it after he has extracted it? Is the strand which he pulls out of the fabric any different from the strand which an industrial historian extracts or the strand which an industrial economist holds up for inspection? The strand is one and the same for all three. The difference is in three different aspects of the fiber being studied. The geographer is interested in how that strand differs from place to place. The historian is concerned with how it varies from time to time. The economist or any other type of manufacturing specialist directs his attention mainly to the nature of the strand itself—to character-

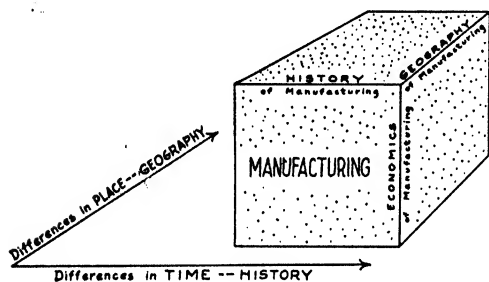


FIG. 2. Adapted from a comparable diagram on page 147 of Richard Hartshorne's "Nature of Geography."

istics and the status of manufacturing in a particular time at a particular place.<sup>4</sup> Perhaps a simple diagram may clarify this idea (Fig. 2). The horizontal dimension represents differences in TIME; the horizontal dimension from front to rear represents differences in PLACE; the vertical dimension represents differences and characteristics existing at a definite

time in a definite place. The block represents a body of knowledge about manufacturing.

The historian is interested in that body of knowledge mainly in the left-to-right dimension; the geographer is interested in the same body of knowledge but primarily in the front-to-rear dimension; the economist and industrial specialist are interested in it in the vertical dimension. All three are concerned with the same body of knowledge, but each focuses on facts which represent a different aspect of that knowledge.

Here then is the connection between geography and manufacturing. Just as there is a history of manufacturing in which one studies the differences in manufacturing from time to time, just so, there is need to examine the geography of manufacturing in which one studies its differences from place to place. Therefore, "Geography of Manufacturing" is a legitimate segment of a geography

<sup>4</sup>The economist frequently considers temporal changes (in which case he is utilizing history), or spatial changes (in which case he is employing a geographic viewpoint).

curriculum, and it focuses attention on regional differentiation in terms of manufacturing.

### THE GEOGRAPHICAL APPROACH

The major questions which attract a geographer in the realm of manufacturing are:

1. Where is the manufacturing? In each region or city, what manufacturing is there?
2. How is manufacturing related to the other geographical elements on which it depends—in both its own region and in other regions? This question is handled most satisfactorily in terms of single industries. For example, the iron and steel industry has a certain pattern of distribution and structure involving the location of iron ore mines, coal mines, limestone quarries, water bodies (for cooling purposes), waterways, ships, railroads, blast furnaces, steel and rolling mills, and markets. This “anatomy and physiology” of the steel industry should be described and analyzed in a geography of manufacturing course. In the discussion of such a question, information will be brought to light for understanding why the industry is located where it is.
3. What is the relation of manufacturing to the total geography of the region in which it is located? In other words, what is the industry like and what significance does it have in its region?

These questions can be approached from the standpoint of individual industries, analyzing the distributional pattern of one industry at a time, or from the regional standpoint in which one region at a time is considered in terms of all its industries. It is toward an understanding of the regions of manufacturing that a Geography of Manufacturing Course is directed.

The false concept that manufacturing is foreign to geography can be corrected only as students in geography courses (in grade school, high school, and college) realize that regional differences can be expressed in terms of cultural elements as well as physical elements and that manufacturing is one of the important cultural elements.

## A LIST OF ARTICLES ON MAPS AND THEIR USE IN GEOGRAPHIC EDUCATION

Published in the JOURNAL OF GEOGRAPHY, 1922-1949

Prepared for the National Council of Geography Teachers by Margaret Chew, George Corfield, and Katheryne T. Whittemore (Chairman), members of the Committee on Lists and Bibliographies on Maps and Their Use in Geographic Education.<sup>1</sup>

### FOREWORD

This annotated bibliography was prepared for the National Council of Geography Teachers as part of the work of the Council's Committee on Lists and Bibliographies on Maps and Their Use in Geographic Education. It makes more easily available valuable articles published in the JOURNAL OF GEOGRAPHY over a period of 28 years and is therefore a suitable first step toward a major objective of the committee, that of increasing the usefulness of material already published on this phase of geographic education.

Classroom teachers in elementary and secondary schools and in colleges will find stimulating ideas and practical suggestions in many of the accounts of teaching done by others. It is hoped that teachers will read about the use of maps at other levels than those at which they teach, because ideas may often be adapted to other situations. For example, the two articles on using maps in testing geographic information, both written by college teachers and relating to college instruction, contain ideas that may be used successfully with secondary school students, and with careful adaptation, with elementary school children.

The large number of articles, 102, indicates the interest of contributors and of the editors of the JOURNAL OF GEOGRAPHY in the use of maps in teaching. The articles cover many phases of the subject but a survey reveals two outstanding themes: the tremendous importance of maps; and the need for carefully guided experiences to develop map reading habits and skills. In addition, the survey reveals topics that have been omitted or that are inadequately treated. A worthwhile consequence may be the stimulation of further study, thought, and experiment in this highly important phase of education.

<sup>1</sup> References to articles published in the JOURNAL OF GEOGRAPHY before 1922 may be found by consulting the *Index to the JOURNAL OF GEOGRAPHY, 1897 to 1921*.

## MAPS: TYPES AND CHARACTERISTICS

Burnham, Guy H. *Map Projections as a Basis for Maps*. 33:142-147, April 1934.

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Blanchard, W. O. *An Energy Map of the United States*. 22:274-278, October 1923.

Suggests converting production figures for petroleum, coal, etc. into horse-power years—for comparison. Shows map of U.S. done on that basis.

Brown, Ralph H. *A Map Sequence of the Belle Fourche Irrigation Project*. 34:109-119, March 1935.

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Gibson, J. Sullivan. *Temperature and Precipitation Map of the United States*. 33:237-240, September 1934.

Presents a map of the United States showing climate by superimposed graphs.

Gustavson, C. G. *Historical Maps and Seapower*. 45:317-321, November 1946.

Points out that maps contribute to distorted conceptions of international relations. Suggests coloring maps to show area dominated by a country at a certain time.

Jefferson, Mark. *An Adventure in Cartography*. 30:201-204, May 1931.

Discusses need of world maps with larger continents of better shape. Recommends six continents on the same scale arranged together on a page.

Raisz, Erwin. *Landform, Landscape, Land-Use, and Land-Type Maps*. 45:85-90, March 1946.

Describes landform, landscape, and land-use maps. Discusses need for a land-type map that would combine information from all three.

Ridgley, Douglas C. *A Lesson with World Maps*. 34:377-379, December 1935.

Recommends that world maps be used and interpreted in relation to the globe. Gives brief description of some world maps. Emphasizes the fact that maps represent real portions of a real earth.

Ristow, Walter W. *Maps: How to Make Them and Read Them. A Bibliography of General and Specialized Works on Cartography*. 42:258-265, October 1943.

Enlarged and reprinted from a New York Public Library bulletin. Includes only studies published since 1939 except for a few outstanding reference books published earlier.

Sites, D. E. *Some Problems of Map Publishers Related to World War II*. 44:145-151, April 1945.

Discusses problems of materials, choice of projection, amount of detail, choice of unit to show distance, frequency of revision.

Spittal, Hugh E. *An Analytical Key to Map Projections*. 48:362-366, December 1949.

A key to help the casual users of projections in the identification of the most commonly used projections.

#### SELECTION OF MAPS FOR CLASS USE

Abrams, Alfred W. *Visual Instruction in Teaching Geography*. 30:145-150, April 1931.

Good and bad points of textbook and wall maps in common use. Recommends use of physical-political maps, map slides, greater use of globes.

Jefferson, Mark. *The Maps in School Geographies*. 21:23-28, January 1922.

Gives author's idea of what maps in school geographies should be like. Critical comments on maps in four elementary geographies in use in 1921.

Martin, Neil F. *Equipping a High School Geography Room*. 38:226-232, September 1939.

Maps, atlases and globes are discussed in one part of this article. Brief mention of ways of showing maps.

Nolen, Luella C. *Check Lists for Use by Teacher and Pupil in Evaluation of Geographic Tools*. 38:205-208, May 1939.

Includes a list of thirteen criteria for teachers to use in evaluating a basic wall map. Also items for pupils to check the maps they make themselves.

Renner, George T. *Educational Revision of Wall Maps*. 40:13-19, January 1941.

The faults of wall maps. Recommends that maps be made quickly and cheaply and designed by cartographers, psychologists and subject matter specialists working together.

#### SOURCES OF MAPS FOR CLASS USE

Gluck, Harold. *Maps Practically for the Asking*. 39:30-36, January 1940.

Sources from which teachers can collect maps for class use. Descriptions for making outline map on blackboard, mimeographed maps, home-made tracing table. Care of a map collection.

Hartley, W. H. *Illustrative Material for Conservation Education*. 42:33-37, March 1943.

A list of map sources includes blackboard maps, economic maps, et cetera. Gives some state departments and agencies that distribute maps.

Raisz, Erwin. *Cartography in 1946*. 45:347-351, December 1946.

Tells of maps produced during the year by various agencies. Commercial companies not included.

Raisz, Erwin. *Draw Your Own Blackboard Maps!* 41:262-264, October 1942.

Suggests using grid as base for drawing generalized outline of continent on blackboard.

Renner, George T. *Blackboard Wall Maps*. 34:369-374, December 1935.

Discusses problem of securing wall maps when little money is available. Suggests that teachers draw conventionalized outlines to use as base maps. Contrasts standards applied to wall maps by cartographers and teachers.

Ristow, Walter W. *Air Age Geography: A Critical Appraisal and Bibliography*. 43:331-343, December 1944.

Atlases and maps of use in air age geography are listed in sections three and four of this article.

#### DEVELOPMENT OF MAP SKILLS

Anderzhon, Mamie L. *What is in the Mile Behind an Inch on a Map or Globe*. 44:288-295, October 1945.

Suggests experiences that help pupils see how many times the scale of the landscape has been reduced to show the pattern or idea expressed by the map, globe or model.

Baker, Emily V. *Diagnosing Children's Ability to Use Maps*. 37:227-231, September 1938.

Gives a diagnostic test for sixth grade based on maps available in textbooks. Suggestive for teachers who wish to make their own tests to discover pupils' weaknesses in reading maps.

Day, Pauline. *Making Geographic Symbols for Rivers Signify Reality*. 42:145-148, April 1943.

Description of lessons designed to make symbols for rivers more real. Emphasis on the river basin rather than the river.

Dudley, Elizabeth. *An Approach to Map Study*. 36:354-356, December 1937.

Tells how third grade made a map on the floor after seeing a map of their city.

Made additions and corrections as they learned about their community. Development of concepts of scale, direction and symbols.

Forsyth, Elaine. *Map Reading*. Series: 42:249-257, October 1943; 42:287-297, November 1943; 42: 327-332, December 1943; 43: 13-17, January 1944; 43:71-75, February 1944; 43:92-96, March 1944; 43:140-144, April 1944; 43:168-174, May 1944.<sup>2</sup>

A series of lessons for junior high school students. Includes instruction in the use of latitude and longitude, great circles, scale, map projections. Gives a test of map-reading skills.

Fuller, Kenneth A. *Developing Map Reading Skills for Global Emphasis*. 42:216-220, September 1943.

Lists the skills basic to the reading of polar-centered maps. Suggestions for introducing them to pupils. Advantages and disadvantages of polar projections. Map study questions based on a north polar map.

Fuller, Kenneth A. *War Maps: Materials for Improving Map Reading Skills in the Junior High School*. 41:296-302, November 1942.

Suggests use of war maps in magazines and newspapers to improve map reading and interpretation. Gives skills needed to use such maps. Standards for evaluating the usefulness of newspaper maps. Diagnostic quiz based on a newspaper map.

Gregoria, Sister Mary. *A Course in Map Study*. 42:346-349, December 1943.

Outline of content for a one or two hour course for high school and college students with no geography since grades. Suggests some exercises.

Hahn, H. H. *Why Failures in the Study of Geography?* 35:225-234, September 1936.

Analysis of 283,000 answers in preliminary tests for construction of Hahn-Lackey geography scale, plus hundreds of answers since. Emphasizes the need for developing meaning before the introduction of a map symbol and for careful instruction in reading maps.

James, P. E. *Developments in the Field of Geography and Their Implications for the Geography Curriculum*. 46:221-226, September 1947.

Importance of map reading as basic to the understanding of all geographic concepts. Urges that map reading skills be taught step by step. Emphasizes the need for constant use of maps.

<sup>2</sup> The articles by Forsyth have been published as one of the Geographic Education Series: *Map Reading* by Elaine Forsyth, McKnight and McKnight, Bloomington, Illinois.

Lloyd, Trevor. *Practical Geography in the High School*. 42:61-68, February 1943.

Describes making a map from an air-view of a place known to pupils as an approach to understanding that map symbols represent realities. Describes exercises that develop knowledge of scale and of contour maps.

Mitchell, Mary Alice. *How and When Does 'Activity' Contribute to a Social Education?* 46:352-357, December 1947.

Urges the selection of activities that will lead to social understanding. Describes map making carried on when eight-year olds studied their community.

Moyer, Josephine and Taylor, Frances E. *Introduction of the Map to Fourth Grade Children*. 34:249-252, September 1935.

Urges introduction of child to map symbols thru a study of realities which symbols represent. Describes a lesson when physical features were discovered in a garden before introduction of a relief map.

Phillips, Mary Viola. *Geography in the New Kensington High School*. 44:216-221, September 1945.

Tells of the deficiencies in map reading skills shown by high school students and the need for training in map reading.

Ridgley, Douglas C. *Some Special Topics in Geography Which Need Special Consideration by the Teacher*. 29:265-269, September 1930.

Among the special topics discussed is that of map reading. Children should learn to use maps without aid of questions by author of textbook or teacher.

Ridgley, Douglas C. *Teaching of Directions in Space and on Maps*. 21:66-72, February 1922.

Describes use of sun, shadows, and stars for determining direction; reading of direction from a map; meridians and parallels as direction lines.

Shyrock, Clara M. *Gradations in Map Learning*. 38:181-187, May 1939.

Gives in considerable detail the grade placement of skills in map reading.

Shyrock, Clara. *Maps and Mapping in the Grades*. 22:265-274, October 1923.

Describes gradual steps for the development of map skills in the elementary school.

Sorenson, Frank E. *The Influence of Specific Instruction on Map Interpretation*. 35:300-307, November 1936.

An account of a study made to discover the influence of specific map instruction in developing interpretative ideas of major geographic understandings.

Staple, Flora M. *A Method of Teaching Daily Time Adjustment to Earth Rotation*. 38:239-244, September 1939.

The concept of meridian was taught from the shadows made by a line of children at noon. The understanding thus developed was then used in map reading.

Svec, M. Melvina. *The Use of USGS Maps at High School Level*. 43:343-350, December 1944.

Ways of teaching junior high school children to read USGS contour maps.

Vegter, Dorothy O. *Introducing Geography to Fourth Graders*. 45:114-118, March 1946.

Included within a general discussion is a description of beginning map work.

Witham, Ernest C. *A Method of Teaching Large Geographical Areas*. 27:180-189, May 1928.

Discusses difficulty of getting correct ideas of area from maps. Compares scales used in the maps in certain texts. Suggests exercises to help children to get accurate ideas.

#### TESTS FOR DIAGNOSING ABILITY TO USE MAPS

Howe, George F. *A Study of Children's Knowledge of Directions*. 30:298-304, October 1931.

Describes an experiment to discover what knowledge elementary school children have of directions in space and on a map. Also investigates their reasons for thinking they know certain directions. Procedure given and results analyzed.

Jessop, Grace F. *A Map for Diagnostic Purposes*. 37:112-115, March 1938.

Describes a diagnostic test used in a seventh grade at the beginning of the year. Objective test based on a hypothetical map.

McDavitt, Neva. *Map Pre-Tests: Devices to Discover the Ability of Pupils to Interpret Maps*. 44:207-209, May 1945.

Describes a pre-test for high school and freshman college classes based on physical-political maps of U. S. Also describes use of maps in certain types of problems.

Miller, George J. *Testing Map Reading Ability*. 30:38-42, January 1931.

Report by Editor of the Journal of a testing program in New York City Schools. Test given to eighth grade children based on maps in textbooks.

Schwendeman, J. R. *Some Experiences in Teaching Sixteen Hundred Cadets of the United States Army Air Force*. 44:152-161, April 1945.

Gives a diagnostic test on map interpretation and exercises used in laboratory work.

## USING MAPS IN GEOGRAPHIC STUDY

Anderzhon, Mamie L. *Writing Our Own Map Language*. 45:35-38, January, 1946.

Junior high school level. Describes map activities used in studying various phases of geography. Recommends the development of overlays to aid study of one factor in relation to other factors.

Aurousseau, M. *The Method of Orientation in Teaching Geography*. 21:140-146, April 1922.

Suggestions for the use of the globe to gain horizontal and vertical orientation. Secondary school level.

Berst, Leada Newman. *Interest-Stimulating Devices: An Electrical Map*. 28:307, October 1929.

How an electrical map was made and used for drill in the location of cities.

Birch, T. W. *Mapping the Monsoons*. 41:32-34, January 1942.

Description of a novel arrangement of a notebook map.

Blouch, Adelaide. *City Study in the Upper Elementary Grades*. 47:306-311, November 1948.

Description of a unit on the home area that included map work of various kinds. Diagram of city colored to show business section, industrial areas, etc. Route of excursion marked on map. Map activities in connection with other cities.

Bozarth, Ruth O. *Map Making in the Snow*. 39:325-326, November 1940.

Brief description of making a relief map in snow.

Burgess, Alvin V. *The Use of Maps in Developing Geographic Personalities*. 40:57-64, February 1941.

Description of a study of Australia based on maps. Raised problem of the distribution of population from map study. Other maps used in solution of the problem.

Caldwell, Naomi M. *An Atlas of France—A Project in Grade VI*. 21:105-109, March 1922.

Interest in articles from France resulted in the making of a product map. This developed into the making of many maps for an atlas of France.

Chew, Margaret S. *Map Making as a Junior High Elective*. 44:85-90, March 1945.

The organization and content of an elective course in map making. Definite directions for map-making activities, materials and techniques.

Cox, Catherine E. *Teaching Africa by Regional Map-Making*. 39:362-364, December 1940.

Tells how a junior high school class worked out a fairly satisfactory regional division of Africa.

Curnow, Irene J. *Map Study for a School in Long Island, New York*. 27:97-109, March 1928.

Describes lessons based on a topographic quadrangle including preliminary class study of the map and field work. High school level.

Dakin, W. S. *Use of Wall Maps in Teaching Geography*. 30:296-298, October 1931.

Urges class exercises based on wall maps that all can see. Topics suggested include latitude and longitude, scale, sizes of cities, altitudes. Recommends use of map before reading text.

Davis, W. M. *Geographic Orientation*. 21:316-319, November 1922.

Critical comments on article by Aurousseau. Contains practical observations on relation of material on orientation to various levels of learning.

Edwards, J. H. *Teaching the Geography of Australia Through Maps*. 46:318-320, November 1947.

Brief description of a study of Australia based on maps. A major objective was the need of concrete evidence of the ability of a sixth grade to read maps and to apply larger generalizations.

Eisen, Edna E. *Geography Field Work with Junior High School Pupils*. 30:61-73, February 1931.

Account of the organization of a geography club. A major activity was the mapping of land use in the neighborhood of the school.

Frank, R. W. *The Use of the Field Trip in Teaching a Phase of the Steel Industry at the Senior High Level*. 45:322-326, November 1946.

Description of a trip to a steel mill. The concluding exercise was the making of a map showing sources of raw materials, lake ports, railroads, similar industrial communities.

Garland, John H. *The Superior School Giant Globe; An Elementary School Activity Project*. 41:328-331, December 1942.

Describes the method of constructing an 8-foot globe.

Gibson, J. Sullivan. *Geography Laboratory Work in the Teachers College*. 33:309-314, November 1934.

Stresses the importance of training teachers to use maps and globes. Suggestions for use of topographical maps, weather maps, maps on various projections in laboratory work.

Hall, R. B. *Local Inventory and Regional Planning in the School Curriculum*. 33:17-22, January 1934.

Discussion of the value of the study of a small area. Specific directions for the mapping of land utilization. Suggests types of maps that can be made of a local area.

Harris, Ruby M. *Spain*. 38:109-112, March 1939.

A description of a unit that includes map activities. Well stated directions for drawing cross-section across Spain on 40th parallel and for making a pictorial map of Spain. Gives list of statements on Spain to be checked true or false from map in text.

Kusch, Monica Henrietta. *An Experiment in Fifth Grade Field Work*. 35:179-185, May 1936.

Included in a description of field work carried on with a fifth grade in Cleveland is an account of the work done with maps.

Kusch, Monica Henrietta. *Geography: A Laboratory Subject*. 39:203-206, May 1940.

Tells of work by children with maps showing city pattern, rail net, rainfall, growing season, etc. A junior high school unit.

Mapes, Carl H. *Creative Map Making in Teaching Historico-Geographical Units*. 39:156-160, April 1940.

Testifies to the value of translating verbalism into the language of the map. Students can finish an incomplete map or make a new one from information gained from reading. Gives several illustrations.

Mikesell, Ruth Weaver. *Geographical Activities Involving the Use of Maps and Grafts*. 33:105-113, March 1934.

A study to determine effectiveness of use of maps, pictures and grafts singly or combined, also measurement of achievement obtained thru selected activities. Gives examples of lessons that showed children did not know how to read maps. Discusses the teaching of map symbols and ways in which maps may be used.

Muse, Grace. *Interest-Stimulating Devices: Comparison Map and Graft*. 29:270, September 1930.

A method of comparing sizes of U. S. and Australia by cutting out shapes and mounting on cardboard so that one stands out from the other.

Parker, Edith P. *Geography and the Community*. 40:98-108, March 1941.

Describes the mapping of a village by a fifth grade. Emphasizes the value of such exercises in training children to see thru maps to the realities they represent.

Phillips, Mary Viola. *Unit III. Population for Course in Global Geography*. 45:142-148, April 1946.

A unit outline that includes many map activities in the study assignment sheet.

Repass, F. C. *Experiment in Teaching Current Geography*. 36:321-324, November 1937.

Description of geography lessons to supplement a social studies course. Based on places in the news. One outcome was the increase in skill in using maps.

Ridgley, Douglas C. *A Lesson with the Globe*. 33:279-281, October 1934.

Lists questions and exercises on the globe.

Simpson, Margaret H. *Interest-Stimulating Device: Learning the Map Thru Postmarks*. 43:272, October 1944.

A third grade became interested in postmarks on Christmas cards, and in pasting them on a map learned names of states.

Smith, Lucy M. *Devices to Create Interest in Geography*. 35:194-199, May 1936.

Several definite map activities are described among other devices.

Smith, Villa B. *The Bulk Freight Trade of the Great Lakes*. 45:257-267, October 1946.

Describes map exercises among the activities in the development of a unit of work at the high school level.

Stamp, L. Dudley. *Land Utilization Survey as a School and College Exercise*. 33:121-130, April 1934.

Describes in considerable detail the way in which the land utilization survey was made by British school children.

Stowell, Margaret. *A High School Class Surveys Its Town*. 41:179-185, May 1942.

Technique of making a land-use map described. Method of organizing and carrying out work given in detail.

Stratton, C. G. *A Fifth Grade Experiment in Mapping*. 21:302-305, November 1922.

A fifth grade class constructed maps of North America by a system of meridians and parallels. Gives samples of maps made. Not contended that this is a proper exercise for fifth grade.

Svec, M. Melvina. *Factors that Influence Climate; Developed by the Use of Deductive Problems*. 45:14-22, January 1946.

Lessons in climate developed largely thru map reading. Secondary school.

Tom, A. O. *Relief Modeling in Elementary Geography*. 39:281-284, October 1940.

Description of how a sixth grade class made a relief model of South America. Evaluation thru comments by children and adults.

White, Helen M. *Diagrammatic Map Making*. 32:242-244, September 1933.

Gives advantage of a diagrammatic representation to emphasize salient features of a map. Illustrates by sketches of the Hudson-Mohawk depression.

Wider, Stella E. *Map Making*. 31:345-347, November 1932.

A method by which children can make outline maps quickly from a prepared pattern. Suggestions for the use of the outline map.

Wilcox, Lillian A. *The Teacher-Made Slide Map and Its Uses*. 27:198-200, May 1928.

Directions for making slide maps and suggestions for their use in various parts of a lesson.

Wyckoff, Dorothy. *Maps Without Culture: A New Aid in the Teaching of Physiography*. 25:307-309, November 1926.

Tells of experimental printing of some USGS maps without culture. Lists advantages for use in teaching geology.

Zachari, Elizabeth D. *Field Trip Experiences in the Intermediate Grades*. 33:49-60, February 1934.

One section of this article describes the development of a community map during a fifth grade unit "Our City Today".

#### USING MAPS IN TESTING GEOGRAPHIC INFORMATION

Brown, Ralph H. *Testing in Geography at College Level*. 36:140-148, April 1937.

In a general discussion of tests and testing techniques are suggestions for using maps and pictures in testing.

Whittlesey, Derwent. *Current Statistics as Fresh Test Material*. 31:79-83, February 1932.

Reproduces a United States map showing ratio of automobiles to population. This map was given to a class in the regional geography of North America for interpretation as part of final examination.

#### GENERAL AND MISCELLANEOUS

Duboc, Jessie L. *Some Questions Teachers Ask Concerning Map Study in the Intermediate Grades*. 32:245-249, September 1933.

Recommends: the use of other maps besides political maps; the study of maps before the reading of the text; the use of a variety of maps of all types; training in the interpretation of facts gained from maps; the need of many experiences to help children understand maps; the delay of the introduction to maps beyond the primary grades; and the correlation of maps and pictures in study.

Hartz, Robert E. *Map Reading by Aviators*. 30:339-341, November 1931.

Describes use of maps by aviators in World War I

Ives, Ronald L. *Viewing Filters Ease Reading of Complicated Maps*. 47:247, September 1948.

Gives brief instruction in the use of various color filters to filter out some colors and to intensify others.

Quam, Louis O. *Use of Maps in Propaganda*. 42:21-32, January 1943.

Points out the false impressions that even scientifically accurate maps may create. Describes characteristics of maps made for propaganda purposes with many examples from German maps.

Ristow, Walter W. *Geographical Information Please!* 38:314-318, November 1939.

Tells of the wide variety of uses made of maps in the map divisions of the New York Public Library.

Saale, Charles W. *Instruction in the Use of Maps Needs to be Increased*. 48:309-316, November 1949.

Discussion of the importance of using maps, some of the ways they may be used, and some problems of training in correct use.

Whittemore, Katheryne Thomas. *The Place of Maps in Social Education*. 47:110, March 1948.

Abstract of chapter appearing in 1948 Yearbook, National Council for the Social Studies.

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This bibliography will appear as Professional Paper No. 10, and copies may be obtained from The Office of the Secretary. Refer to a current issue of the JOURNAL OF GEOGRAPHY for the name and address of the present Secretary. Price, 25¢.

## THE NATIONAL COUNCIL AT WORK

The 1950 meeting will be held at the Edgewater Beach Hotel, Chicago, Illinois, on Friday and Saturday, November 24 and 25. The completed program will be announced in the News-Letter which will be sent to the membership of the National Council during October. **Make your reservation for the meeting now; write the hotel directly.**

Among many important items on the program are the following:

1. A panel discussion by the American delegates to the UNESCO international seminar on "The Teaching of Geography as a Means to Developing International Understanding." The panelists, who officially represented the United States at the meeting in Montreal during July and August, are Thomas F. Barton, Indiana University, Zoe A. Thralls, University of Pittsburgh, Marion H. Seibel, School 52, Buffalo, New York, and Sister Mary Ursula Hauk, Johnstown, Pennsylvania.
2. A panel discussion on "Procedures and Findings of a Study Group of Teachers in Geographic Education" conducted by members of the Southwestern Pennsylvania Study Group under the direction of Eugenia M. Baxter of Monongahela, with Mrs. Erna Grassmuck Gilland as consultant.
3. A section on Elementary Geography, including a paper by Professor George T. Renner of Teachers College, Columbia University, on "Learning Readiness in Elementary Geography."
4. A section on High School Geography, including a paper by Professor Ruby M. Junge, School of Education, Michigan State College, on "Geographic Concepts in High Schools."
5. Papers on teaching aids of various sorts. Among these papers there will be one on "The Use of Radio as a Teaching Aid in Geography" presented by Professor Harry J. Vander III of the Texas State University for Negroes. It is also probable that the recently completed movies on community resources will be presented by specialists of the United States Office of Education.
6. Papers of direct implication for in-service training of teachers, such as "Potential Uses of Government Libraries," to be presented by Arch C. Gerlach, Chief of the Maps Division of the United States Library of Congress.
7. "A Survey of College Geography" by Joseph R. Schwendeman of the University of Kentucky.
8. A joint session with the Central Association of Science and Mathematics Teachers on *Mathematical Geography*; this section will also include a paper by Otis W. Freeman, Eastern Washington College of Education, Cheney, and formerly Specialist in Geography for Higher Education in the U. S. Office of Education, on "Geography Among the Sciences."
9. A joint session with the Central Association of Science and Mathematics Teachers on *Conservation*.
10. A banquet Friday evening, November 24. The speaker will be George T. H. Kimble, the new Director of the American Geographical Society of New York, and, until last June 30, the Chairman of the Department of Geography at McGill University, Montreal.
11. A joint mixer with the members of the Central Association of Science and Mathematics Teachers immediately following the banquet.

The Distinguished Service Award, the Richard Elwood Dodge and the Ray Hughes Whitbeck prizes, and other awards will be made at the meetings. In addition the National Council of Geography Teachers will aid in the celebration of the 50th anniversary of the Geography Section of the Central Association of Science and Mathematics Teachers.

## NATIONAL COUNCIL FELLOWS

The following members of the National Council of Geography Teachers have completed five or more consecutive years of affiliation, and have been elected FELLOWS.

Essie O. Abeel	Agnes E. Hart	Leland R. Pederson
Clifford Adams	E. Lillian Hartvigh	Sidman P. Poole
Asbury Park High School	Grace C. Hetu	George Porter
Vera K. Baxter	Holy Name College	Iris Prat
Mabel R. Beaver	Charles W. Jennings	Margaret Puff
Ruth Belcher	Rayburn W. Johnson	Henry A. Ragaz
Ann Berich	Clarence F. Jones	Minnie E. Reberry
Nora L. Bernard	Lucille Kenny	Agnes Renner
Hugh W. Blanchard	N. T. Kias	E. H. Runkwitz
Ruth B. Bodenham	Belle M. Landry	Marvin J. Schroeder
Viola M. Bohn	David W. Lantis	Pauline P. Schwartz
Stanley Bowmar	Wilma Laux	Gladys Schwenk
Catherine L. Braun	Jean C. Lawrence	Sidney Sherman
T. Taylor Broun	Dorothy Lea	Felipe Silva
Guy H. Burnham	Lizzie Lee	A. Marie Spence
Daisy S. Buttgen	H. C. Lucas	Ruth H. Stanley
J. P. Carey	Edward D. Ludwig	Joy Stover
Vernon Carter	Carl H. Mapes	Ethel Tatham
Mary E. Case	Sister Clement Marie	Mazie O. Tyson
Harvey Cornell	Howard H. Martin	Harvey A. Uber
Mary Croyle	Maurice E. McGaugh	Clarence L. Vinge
R. W. Caauwe	Mabel L. McGirr	Thelma I. Waddle
Marie Davis	J. S. v. d. Merwe	William R. Walker
George C. DeLong	John W. Morris	Morgan L. Walters
Sigismond deR. Diettrich	C. F. Moses	Arthur Wassburg
L. B. Dolan	Josephine Moyer	Alice F. Weaver
N. N. Duncan	Florence A. Murphy	Gertrude Whipple
Lyle R. Fletcher	Ruth Myren	John White
James H. Glasgow	Pearl Noland	Bert L. Wills
Lee H. Griffin	J. Warren Nystrom	George S. Woodman
Ann C. Grove	Clarence W. Olmstead	Marion I. Wright
Edith C. Hammerlund	Ross N. Pearson	Vera Zeip
Cordelia Harbeson		

## CONTRIBUTING MEMBERS

The following are new Contributing Members of the National Council of Geography Teachers for 1950.

Edna Arundel	E. C. Chamberlain	Alfred R. Marsh
W. W. Atwood, Jr.	Margaret B. Downs	Helen Mixter
Irma A. Buell	Vernor C. Finch	Marion Jo Read
Daisy Buttgen	Cordelia Harbeson	

## GEOGRAPHICAL PUBLICATIONS

Ronne, Commander Finn (U.S.N.R.), **Antarctic Conquest**, xx and 299 pages, 6 maps, 51 figures. G. P. Putnam's Sons, New York. 1949.

This frank forthright account of the Ronne Antarctic Research Expedition of 1946-1948 will impress both the polar expert and the general reader by the great amount that was accomplished by so few people with only \$50,000 plus the loan of government equipment which in return was systematically tested under polar conditions. Impressive, too, was the careful planning and meticulous precaution taken regarding every detail so that man and machine might withstand the unpredictable Antarctic. Moreover, it was the first time that a woman wintered in the Antarctic, and it is noteworthy that the two of them performed regular expedition tasks.

From the main base on the west side of the Palmer Peninsula 450,000 square miles, extending to the head of the Weddell Sea, were explored by air supported with ground reconnaissance surveys. Great pains were taken in the latter effort to obtain ground control for the aerial photographs which would otherwise have been of little value. The trail and air operations were so coordinated as to supply the former by air while the ground parties provided weather data and were available to aid the airmen should they have been forced down in the field. Ronne devised a "leapfrog" method by which one plane was used to haul gasoline to refuel the survey plane in the field, greatly extending the range of the latter. Much of the success of the flights was due to the excellent forecasting based on meteorological observations at the main base, at the advanced base, and by the field parties. A total of 86 landings were made in the field in support of field parties, to refuel, or to obtain astronomical fixes. In addition to the geographical exploration systematic work was carried on in biology, geology, seismology, solar radiation, cosmic rays, atmospheric refraction, terrestrial magnetism, and tides.

A valuable addition to any library, *Antarctic Conquest* will serve as a handbook of the latest methods in polar exploration. It tells a forthright and compelling story of the expedition unvarnished with the heroics which mar so many books on exploration. Because the explanation of the various phases of the scientific program is rather complete as well as simple and clear, this book should prove to be a popular and a valuable item for supplementary reading in high school and college geography courses.

*Catholic University of America*

KENNETH J. BERTRAND

Anderzhon, Mamie Louise, **Steps in Map Reading**, Rand McNally and Company, Chicago. Pages, 156. Paper binding. Price \$0.69.

Maps are of value only to those who know how to read them. For many people this means merely the ability to find some place on the map. But such a simple skill as this is not map reading. The map has a language all its own and consists of a series of symbols. To read a map, therefore, one must be able to recognize the symbols and by noting their arrangement, use them to interpret geographical problems, as well as, to discover new facts and relationships existing between man and his earth. Map reading is not an end in itself but a means of discovering new truths about the earth. Geographers are not the only people who use maps, but the map and the globe are essential tools of the geographer.

As the author states: "*Steps in Map Reading* is truly a work book." The student develops skills, concepts, and understandings by working directly with maps and globes. The book provides a systematic course in map reading, proceeding from simple, essential yet basic concepts to those that are increasingly complex. No step can be omitted, but each new idea presented is a link in the complete understanding of the map.

The wide scope of skills developed is readily seen by noting the chapter headings:

Finding Directions, Up and Down Directions, Maps Tell Where Places Are, Land, Water and Shore Lines on Maps, Altitude—How High is the Land, North and South of the Equator, Reading Climate on a Map, Maps Tell Us Where People Live, Transportation Routes on Maps, Political Symbols on Maps, Longitude and Time, Map Scales, Globe Distances and Directions.

The method for the development of these skills consists of a series of well worked out map exercises with questions to be answered. Pictures and maps are used with excellent results. Many review lessons are included which combine a number of skills developed.

There is no attempt at grade placement of the exercises, but the workbook can be used effectively at a number of levels of instruction. It can be used in the elementary schools in grades five and six, in the junior high school, in senior high school and certainly it can be useful in the training of elementary teachers in teachers colleges.

The book is well illustrated, containing forty-eight maps and diagrams and twenty-five pictures. It is bound in a substantial paper binding that opens easily for working. Most teachers of geography will find this an excellent book to have as they develop map skills with their students.

*State Teachers College Valley City, North Dakota*

INA CULLOM ROBERTSON

Paul R. Hanna and Clyde F. Kohn, *Cross-Country, Geography for Children*. 160 pp. Scott, Foresman and Company. New York. 1950.

*Cross-Country* is the fourth grade book in the Social Studies Series: Curriculum Foundation Program. It is written in third grade vocabulary and can be easily read and understood by nine-year-old children.

The full length story *Cross-Country*, which deals with a series of planned geographic experiences, is presented in the following 7 units: Home in Los Angeles, California; Across the Desert; Through the Mountains; Across the Plains; Up from the River; Down to the Ocean; Home in Washington, D.C.

Altho the people in *Cross-Country* are fictional their activities are those of our own age in a setting of real places, regions, and cities. The experiences and activities of the children in the story are presented at the observational and participating levels. Pupils using this book will feel they have lived a series of geographic experiences as they identify themselves with the people in the story.

Unlike other fourth grade geographies, which present selected regions in the world from north to south, *Cross-Country* is a west to east geography of the United States. All of the places in *Cross-Country* are approximately the same latitude. The season is mid-summer. The development of latitude and seasonal variations are deferred in this series until a later book.

There are 142 well selected illustrations, many of which are colored. The illustrations are without captions but are referred to in the textual material.

The 28 semi-pictorial maps are planned especially for the book, and map symbols are introduced on simple maps. At the end of each unit the continuity of the story is interrupted by a brief non-fiction world-orientation section. This section might profitably be supplemented by the use of a simple globe and explanation from the teacher.

The teacher's edition includes a large physical map of the United States which the pupils may place on the floor, and use as they follow the Page Family from west to east across the United States.

*Oak Park, Illinois*

MAMIE L. ANDERZHON

# *The* JOURNAL of GEOGRAPHY

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VOLUME XLIX

NOVEMBER, 1950

NUMBER 8

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## ASIA LOOKS AT LATIN AMERICA\*

GEORGE B. CRESSEY

Syracuse University

During January and February of 1950 I had the opportunity of visiting the geographers of 13 countries in Latin America. I went on business for the International Geographical Union and had little time for professional study, but I want to record a few observations which came to me as an Asiatic geographer—and I hasten to express my appreciation to the many colleagues in Latin America who helped me to secure a hasty glimpse of their countries.

My title is "Asia Looks at Latin America" or more properly "An Asiatic Looks at Latin America." It would be enough to merely describe a few of the many high points of my trip, all of it by air, but I venture to do so against the background of my wanderings in Asia. You may have never thought of similarities between these two continents; the one old, the other new; and I do not wish to force any comparison. Rather, I want to report impressions of Latin America in comparison with my experiences in Asia.

If you are looking for the exotic, you may be disappointed in South America, especially along the east coast. It might well be renamed New Europe, or South U.S.A. Because of the bulge of Brazil, Rio is closer to Lisbon by boat than to New York, but by air the situation is reversed. One finds United States products everywhere. Only along the west coast, in the lands which had an Indian population, are there interesting arts and crafts; or historic depth. Asia has its Europeanized port cities such as Bombay

\* This paper was presented at the meetings of the Association of American Geographers, Worcester, Massachusetts, April, 1950.

or Shanghai, but the Orient is ever near and obvious. I found much fascinating geography in Latin America, but I would not exchange it for Asia. The Andes are superb, but the Tien Shan or Karakorum are better. The Atacama is desolate, but the Taklamakan is more so.

### SOME COMPARISONS

May I list several minor contrasts or comparisons, and then come to a few of greater significance.

While Asia has only twice the area of Latin America, its population is fifteen times greater. I have not checked data on arable land, but the contrast may be less since the average standard of livelihood is lower in the Orient.

The city in Latin America which impressed me most for the unspoiled charm of its Spanish colonial architecture was Lima. In a curious way it reminded me of Peking, where the choicest of Chinese culture is preserved. For another comparison, Panama reminded me of Singapore; both crossroads of world commerce. You might not have grouped Mexico City with Shanghai, but I found remarkable similarities in their foundation problems. Both are built on mud, and the older buildings, such as the Palace of Fine Arts in the former or the 13 story apartment house near the French Club in the latter, are slowly settling. Each might learn from the other as to techniques of sinking piles.

Those of you who know India are familiar with the hydro-electric developments near Bombay where eastward flowing drainage on the Deccan is ponded and diverted to drop over the Western Ghats. I found a similar situation at Santos where water from the inward sloping plateau is directed down the Brazilian escarpment. The resulting electricity is used as far away as Rio. Both escarpments have exceptionally heavy rainfall, with as much as 240 inches in one year back of Santos.

No geographer can take more than a superficial look at the west coast of South America without repeated awareness of the Humboldt Current, a phenomenon which is more of an upwelling of cold water than an actual current. Asia has no such influence on its climate, but it too has oceanographic interests in the Kuro Siwo and the monsoon drifts of the Indian Ocean.

I did not visit the new blast furnace and steel mill at Volta Redando, but it is clear that Jamshedpur and Kuznets place Asia far ahead in iron and steel production. Nor did I have an oppor-

tunity to compare rubber production at Belle Terra with that in Malaya. Puerto Rico has a remarkable development of karst topography, but it must take second place to that of Kweichow and southern China.

But lest you suspect that I am trying to make a case for Asia, let us take a look at urbanization. To a hasty traveller such as I was this winter, one of the most striking impressions is the spectacular



FIG. 1. Sao Paulo in southern Brazil is one of the most rapidly growing cities in Latin America. The tallest building is the 26 story Bank of the State.

growth of the cities in Latin America. I visited 16 cities with a combined population of 15 million; four of these had two million or more apiece. Dozens of new apartment houses or office buildings are in construction, many of them upwards of twenty stories in height. The building of the Ministry of Education in Rio is about the most modern in the world. You will see a replica in the new United Nations building in New York City. For an Asiatic comparison, there is nothing to match Rio and Sao Paulo unless it be

Tokyo and Osaka. Buenos Aires with its four million is far more modern and prosperous than Shanghai with its four and a half million. The material advantages on the side of Latin America appear equally obvious in smaller towns.

Both in Havana and elsewhere in Cuba I was repeatedly reminded of Manila and the Philippine Islands. Each city has its old intra-muros; each island has its sugar cane and tobacco, each has strong remnants of Spanish occupation.

Other similarities came to me between the landscapes of Rio Sao Francisco in Brazil and the Godavari in India, or the climate of Mexico City and Kunming. One may find contrasts between the untouched forests of the Yenisei and the Guianas, and between the marine tropics of Indonesia and the continental tropics of Brazil.

#### BELEM VS SHANGHAI

May I now suggest four comparisons in more detail. Belem is a city of 300,000 near the mouth of the Amazon. Its analogue is Shanghai near the mouth of the Yangtze with 15 times the population. The Belem U.S. Consular district, which includes the entire Amazon basin, numbers but 150 United States citizens, while 30 times as many normally live in the Yangtze Valley. The entire Amazon population is but one and a half million, while the Yangtze drainage basin counts 150 million. What makes a great seaport? Why are these two cities and rivers in such contrast? Both rivers are admirable for navigation, but while the Yangtze may be the world's busiest, the Amazon's traffic may be not much more than that of the rivers of Siberia. I might go on to compare soils and minerals, but you have already anticipated the contrasts in climate.

Will Belem ever match Shanghai? It is growing and will obviously become more important. Someday man may conquer the Brazilian tropics, but their soils are so poor that it does not seem likely that they will ever duplicate the productivity or population of central China. The areas differ in the amount of European capital and initiative which they have absorbed, and the domestic markets are in sharp contrast. If compared on the basis of simple maps, the two rivers and their two cities have much in common, but when one looks at rainfall and temperature, or soils and vegetation, major contrasts appear. Central China has an uncomfortable summer, like the Amazon, but it also has a stimulating winter climate which is lacking in northern Brazil.

## TITICACA VS KOKO NOR

Let me change from the tropical lowlands to the Altiplano. The airport at LaPaz lies at 13,404 feet, the highest in the world, and its runway must be one of the longest. Flying over Bolivia brings many reminders of Tibet, but with surprising contrasts in land use. Let me compare Lake Titicaca with Koko Nor. The Bolivian lake has an elevation of 12,500 feet; its Tibetan counterpart is 2,000 feet lower. Koko Nor is beautiful but desolate. I doubt



FIG. 2. Thousands of Indians live along the shores of Lake Titicaca in Bolivia. Cultivation is limited to the lower slopes.

whether a single tree is to be found around its shores. There is absolutely no cultivation, and not a town or settlement other than a few nomadic encampments. I did not find a single building around the eastern end. There is grazing of a sort, but the few herds are miles apart. There is no fishing for there is not a single boat. An island monastery is accessible only across the ice in winter.

Although Titicaca is 2,000 feet higher, its shores have excellent agriculture. The population must number tens of thousands. While trees were formerly lacking, so that people built balsa reed boats, there are today groves of eucalyptus. I found many motor boats and there are four steamships. Bolivia is extensively cultivated

up to 13,000 feet, and even to 14,400, whereas the Koko Nor area of Tibet has few fields above 10,000 feet. There is nothing in Tibetan history to match the great Inca culture of the Altiplano, or its predecessor the Tiahuanaco. The branch of the Pan American Highway which leads to Titicaca is nothing wonderful, but it is far ahead of any road to Koko Nor. And Titicaca is reached by two railways, and has delightful resort hotels.

Koko Nor is a salt lake yet freezes over. Titicaca is fresh water and does not freeze despite its greater elevation. Both native



FIG. 3. Koko Nor lies in a desolate basin of northeastern Tibet. Trees are entirely absent and cultivation is impossible; only a few wandering Tibetans inhabit its shores.

peoples are colorful in their dress, both areas are very photographic. Near Titicaca is a large city, LaPaz, with a market for the fresh vegetables and wool of the lake area; no comparable outlet is available for the products of Koko Nor.

Both lakes lie near the upper altitude of local land usability, the one is just above, the other just below. Why is the higher lake the one which is more developed? Proximity to the ocean is a dubious asset. Both areas have long been settled. Titicaca may have twice the precipitation, but it is limited in both cases. The answer appears to lie in latitude. Titicaca is but 16 degrees from the equator, while Koko Nor is 37 degrees.

## ATACAMA VS TAKLAMAKAN

Let us now turn to two of the world's driest deserts, the Atacama and the Taklamakan. Both are as nearly without rain as any places on earth. There is not a twig of vegetation or a blade of grass. Spectacular sand dunes characterize parts of both deserts; elsewhere the wind has swept away all movable material. It may be worth while to emphasize that the perfection of crescentic barchons is found only with minimum amounts of sand moving over a desert pavement. And yet both areas bear dramatic witness to the work of running water. Hill and mountain sides are trenched with sharp canyons. Broad alluvial fans stream onto the lowlands. Playa basins show encircling shore lines. Climatic changes have undoubtedly occurred, but these are also the phenomena of today.

What happens when it does rain?—for no area is truly rainless. The statistical average may be less than an inch a year, but this may mean that once in a decade there are 5 inches in a day. There is then no vegetation to check rain off, and catastrophic erosion may occur within a few hours. In such an environment, all of life struggles ceaselessly against aridity. The nitrate port of Antofagasta in northern Chile drinks water from Bolivia, brought in a six inch pipeline. In the Taklamakan water likewise comes long distances, not by pipes but via underground tunnels or karez.

## ESTANCIA SAN PEDRO

One of the high points in my trip to Latin America was the visit to a great Estancia in Uruguay, one hundred miles north of Montevideo. Here I found an 85,000 acre ranch with 40,000 sheep, 14,000 Hereford cattle, and 1,000 horses. There is nothing like this in the Orient and I was puzzled as to any Asiatic analogue. Perhaps the best comparison would be a collective farm I visited in Soviet Middle Asia near Samarkand. The differences are obvious, but there are similarities. The Uruguayan estancia employed 30 families plus 25 single men, with profit sharing, while the Soviet cooperative had 140 families. Samarkand is drier, with some irrigated cultivation. Both are naturally treeless except along the streams. Both have rich soils. I was royally entertained at each, but in very different style and with quite different food. Estancia San Pedro has a magnificent manor house, with hospitality in the

best international style; it is the center of a small empire. The Samarkand collective has no palatial buildings but I was given a variety of food which I shall probably remember longer. The 85,000 acres of the estancia are divided into 60 fields or potraros, a few of them in cultivation, others aforessted, but most devoted to pasture. I saw not a cowboy, altho there may be some, instead there are jeeps. Elsewhere in Uruguay, as in Argentina, these great ranches are in process of subdivision into smaller farms. The



FIG. 4. The short grass pastures of Uruguay enable Uruguay to be a large producer of beef. Here are some of the 14,000 Hereford cattle of Estancia San Pedro.

same process has already taken place in the longer settled lands of Soviet Middle Asia.

What then does an Asiatic geographer see as he visits Latin America? These similarities are in part superficial tho suggestive. Latin America is new, the Orient is old. One continent is densely populated, with a culture alien to our own; the other sparsely inhabited, but with familiar types of living. Both offer fascinating geographic problems in abundance. You will understand me if I choose Asia.

## URBAN GEOGRAPHY IN THE HIGH SCHOOL?\*

HOWARD J. NELSON

University of California, Los Angeles

At mid-century the urban areas of the world are increasing in numbers and in size. Modern cities have become workshops of an industrial society, nerve centers of a vast and delicate service and commercial mechanism, foci of transportation, seats of governmental authority and hearts of contemporary cultural activity. In the United States cities have become the home of a majority of our citizens. We are indeed living in an urban age.

In recognition of the growing importance and increasing complexity of the modern city, the various social sciences are developing specialized branches to investigate the nature of these unique structures. The systematic branches, studying similar classes of phenomena, are developing urban sociology, urban land economics and municipal government. Historians are investigating the urban scene, from their viewpoint of association in time. Geographers, with their special interest in spatial associations, are beginning to develop urban geography "concerned with man's dynamic pattern of urban occupancy in its total setting."

In the past, activity in the specialized branches of the social sciences has taken place largely on the college level. Today, secondary schools, reflecting the civilization of which they are a part, are giving increasing attention to the investigation of urban areas. However, the discipline whose viewpoint will be used in carrying on these studies has not yet been definitely chosen.

High school civics courses have for a long time considered the problems of urban government and society. Recent modifications in these courses seem to indicate a trend away from an emphasis on government and sociology toward geography. Atlanta, Boston and Los Angeles have adopted new high school texts devoted to the analyses of urban areas. The content of these new texts bears little resemblance to the sort of material commonly handled by civics teachers. Emphasis is now on the location, forms, functions, problems and plans of cities—everyday grist for the urban geographers' mill.

This new development poses several questions worthy of con-

\* Presented at the annual meeting of the California Council of Geography Teachers. Stanford University, May 6, 1950.

sideration by members of our profession:

1. Exactly what is the nature of these new courses as outlined in their textbooks?
2. Is this really urban geography?
3. If so, is urban geography a logical and worthwhile contribution of our discipline to the high school curriculum?
4. What action, if any, should be taken by geographers in the light of these facts?

It is the purpose of this paper to consider the above four questions. Let us begin by reviewing the three new textbooks.<sup>1</sup>

*Building Atlanta's Future* is designed for students at the eighth or ninth grade level, in the schools of that city. The study begins in the best geographic tradition—the area is delimited, the city is placed in its regional setting, and the physical and human resource-base of the tributary area is analyzed. The present population of Atlanta; the economic activities of the people, and the physical layout of the city in which they live and work, is considered in some detail. A third section discusses some of the urban problems of Atlanta: transportation, water supply, sanitation, housing, slums, suburbs, education, recreation and social services. Final chapters point out the need for both citizen understanding and action in planning for the solution of Atlanta's problems.

*Surging Cities*, a text used in the Boston schools at the twelfth grade level, is the work of city planners. The first half of the book considers cities in general, and presents material appropriate for students of cities anywhere. Sections on the historical evolution of cities, the growth of five American cities, and the city plans of Peking, Paris, Washington and London furnish specific, if brief, examples of important urban areas. Attention is given to a systematic analysis of residential areas, commercial centers, industrial districts, internal and external transportation patterns, civic centers and public services.

Part Two of *Surging Cities* is concerned with planning for greater Boston. The present physical city and population is

<sup>1</sup> John E. Ivey, Jr., Nicholas J. Demerath, Woodrow W. Breland. *Building Atlanta's Future*. Chapel Hill, The University of North Carolina Press, 1948. 305 pages. \$3.50.

Theodore T. McCrosky, Charles A. Blessing and J. Rose McKeever. *Surging Cities*. Boston, Boston Development Committee, Inc., 1948. 287 pages. \$2.25 (paper cover). \$3.00 (cloth).

Mel Scott. *Metropolitan Los Angeles: One Community*. Los Angeles, The Haynes Foundation, 1949. 192 pages. \$5.00.

analyzed briefly. A discussion of the various urban elements previously analyzed systematically, this time with reference to the Boston area, completes the volume. Each item is discussed in terms of present problems and planned solutions. (Excellent maps and stimulating aerial photographs are present in lavish abundance.)

*Metropolitan Los Angeles: One Community*, is a somewhat similar book, written by a planner, Mel Scott. It seems destined for widespread use in the twelfth grade Social Studies programs in the schools of the Los Angeles area.

The book begins with a brief survey of modern Los Angeles, describing the gross land use pattern and its relation to the natural landscape. A consideration of the development of the urban area from the arrival of the Spaniards to the present day follows. The founding of the numerous towns, activities of individual promoters, as well as the changing economy and expanding area are emphasized.

A chapter considers the present day population in terms of origins, occupations, income, social characteristics and areal distribution. The economic activities of Los Angeles are then analyzed with emphasis on recent developments, employment and location.

The remainder of the work treats the special problems of metropolitan Los Angeles: water supply, energy resources, waste disposal (including smog), land use patterns, transit, housing, residential neighborhoods, schools, other cultural institutions, recreational areas, community services, and the master plan.

To the extent that the courses follow the texts, the foregoing is a description of the subject matter now included in the curriculum of the high schools of at least three of our large cities. Are courses of this sort, tho labled something else, really urban geography? What, anyway, is urban geography?

To my mind, urban geography is best approached by a consideration of man's dynamic pattern of urban occupance in its total setting. A course in urban geography on the college level usually examines the origin and development of urbanism, analyzes the world-wide distribution of cities, investigates and compares urban patterns, forms and functions, studies the forces affecting urban land use, and touches on the geographical aspects of city planning. The regional geography of individual cities is generally included, as well as the differential character of the cities of the world, considered in relation to other geographic differences.

The content of the three books under discussion fits fairly well into the above concept of urban geography. In the Atlanta and Los Angeles studies the regional geography of the individual city is stressed, with location, pattern, form, function, and city planning receiving emphasis. In the first half of *Surging Cities* a number of cities throughout the world are analyzed, while in the final section, the city of Boston is the focus of attention.

On the other hand, from the viewpoint of geographers, certain fairly obvious weaknesses are apparent in all of these texts.

*Surging Cities*, for example, is oriented around existing city plans. The authors tend to come forward with *the* planned solution to a problem rather rapidly. In general, the need for understanding the complex interrelations of the elements for which plans are being made is not stressed. No possible alternative solutions are offered—implementation, apparently, is all that is needed.

A geographer writing a textbook on Los Angeles would probably put considerable emphasis on the major land use areas within the metropolis. A general land use map would be included. The extent to which the livelihood of Los Angeles is dependent on the surrounding area might also be given more attention.

Perhaps a geographer would not produce books exactly like these. Differences in emphasis and organization would be expected. But possibly the differences would be but little greater than those occurring among the works of individual geographers.

Thus, in spite of varying emphasis, and tho these courses are not called geography or taught by geographers, I think we can say that in effect urban geography *is* now being taught in a number of our high schools.

But, we might ask, is urban geography the proper contribution of our discipline to the secondary school? Surveys indicate that where geography has had a place in high school at all, world geography or economic geography is the usual offering. Recent writings by eminent geographers suggest global geography or a similar course as appropriate for the secondary student.<sup>2</sup> Apparently urban geography has not heretofore been considered, much less offered, at this level.

<sup>2</sup>See Lathrop, H. O., "A Suggested Course in the Geography of Nations," and Warmen, Henry B., "A Suggested Course in World (Or Global) Geography" in *Geographic Approaches to Social Education*, Nineteenth Yearbook of the National Council for the Social Studies. Washington, The National Council for the Social Studies, 1948, pp. 239-272.

Perhaps in the light of new opportunities a reconsideration of earlier decisions is in order. What is the case for urban geography in the high school?

1. In the first place, in 1950, we are living in an urban age. In the United States, ten years ago, almost six persons out of every ten lived in areas considered urban. Nearly half of our population resided in 140 large metropolitan districts. Signs point to an increase in these proportions when the current census is reported. In California, it is estimated that nearly three-fourths of our citizens live in seven metropolitan districts. Los Angeles and San Francisco together, account for nearly two-thirds of the state's population. Urban areas are, and apparently will be for the immediate future, the home of an increasingly large majority of our citizens.

2. The concentration of a large number of people in a comparatively small area, gives rise to unique problems of a complexity worthy of separate and specialized study. The intimate and necessary daily contact of masses of people in compact residential areas, on constricted transportation arteries, and within piled up business and manufacturing districts, magnifies error in layout and disharmony in form. The specialization of areas and individuals adds to the problem.

3. In large measure, urban problems are susceptible to local solution. It is true that the destiny of a city is inexorably tied up with the fate of the region, nation and world order of which it is a part. None-the-less, the extent to which a city is a pleasant or an irritating place in which to live, and the extent to which a city prospers or declines, is not predestined or inevitable. Much can be done by citizens to shape the future of their own city. For in final analyses, it is the relative success of individual cities within a similar framework of national and international influences that make a city a desirable or undesirable place in which to live and work. Specialized knowledge, of the sort urban geography can provide, in the hands of the large mass of citizenry, seems essential for this purpose.

4. Then, too, is not the building of local understandings equally as worth while as striving for world understanding? There is no question as to the value of a course in world geography in the high school. Survival in the modern world requires effective citizens, possessed with understandings of homelands other than their own. But the solution of local problems is fully as important. To a large

degree our nation's strength: its industrial plant, economic organization and cultural institutions, exist in an urban setting. Their preservation and efficient functioning is a prime necessity. It would seem doubtful, therefore, if success is possible on the world scene if we fail on the local stage. Further, knowledge and confidence gained by experience in solving problems on the local level will prove invaluable in the world arena.

5. There is a recognition of a need for the sort of knowledge urban geography can contribute to the solution of urban problems. The modification of existing courses and the organization of new ones including the materials and techniques of urban geography indicate a felt need for the geographic contribution. City planners, business groups and other citizens' organizations are insisting that a place be made in the high school curriculum for urban analysis.

6. One of the most valuable contributions of our discipline to the common task of understanding human life on earth is its special line of approach. Surely training in the chorographic approach, and practice in dealing with "unassorted localized phenomena," can be obtained as well in one field of geography as in another. In fact, the urban branch would seem a particularly happy choice for training in our viewpoint. A wide variety of landscapes are available within a relatively small area. First hand observation and extensive field work is possible. Then, too, local urban problems are of concrete importance to the student and excite immediate interest.

Not only is the case for urban geography strong, but, as we have seen, the subject is actually being taught in the high schools of at least three large cities, tho under some other name. How should geographers react to this challenging development? Should we be piqued because success comes from an unrequested quarter and fails to recognize our discipline by name? Should we remain passively neutral and uninterested? Or should we be enthusiastically happy, claim direct relationship to this unexpected offspring, and encourage the extension of similar courses to other schools?

The latter alternative seems to me to be the most appropriate. Geographers might well be gratified by the appearance of these new books and new secondary school courses. In a real sense the publication of the texts and their adoption by high schools is a belated recognition of a need for the sort of understandings geographers are trained to promote. Members of our profession should be alert to encourage proposals by other schools to introduce geographic studies of urban areas into the secondary curriculum. We

should encourage and assist the teachers of these courses to obtain training in geographic methods. Most important of all, geographers should seize every opportunity to demonstrate our ability to provide textual and cartographic materials, as well as trained instruction, for any general courses dealing with man's most complex structure—the Twentieth Century City.

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## PROGRESS IN WEST GREENLAND

TREVOR LLOYD

Dartmouth College

Accurate information on the modern development of Greenland is not easy to secure from reference books. This is particularly strange, because among Arctic areas it is the one where most scientific research has been carried on, and where the best and most continuous records have been maintained for over a century and a half. Students of geography, limited to the English language, cannot readily obtain a clear and simple picture of the physical environment of the island; of its resources and their development; of the native peoples, their modern culture; and the plans which are now being carried out for their advancement.

One of the best geographical studies of northern peoples is that published by the late Dr. Elmer W. Ekblaw concerning the Polar Eskimo.\* It was based on four years of residence among them, about thirty-five years ago, and has stood the passage of time well. Unfortunately, it was representative of an isolated group who were not typical of the great majority of Greenlanders. It tended to strengthen the impressions gathered from the works of Peary and other American explorers who had used north-west Greenland as a base for reaching the North Pole.

Both thirty-five years ago and today, most of the permanent residents of Greenland follow a life radically different from that of the Polar Eskimos. It is, in fact, a misapprehension to think of them as Eskimos, since they have been in direct contact with Europeans since shortly after 1720, and both in their culture and in their physique have become modified as a consequence. This paper summarizes the physical and human geography of the south-

\* Ekblaw, W. Elmer, "The Material Response of the Polar Eskimo to their Far Arctic Environment," *Annals of the Association of American Geographers* 17, 1927, pp. 148-197.

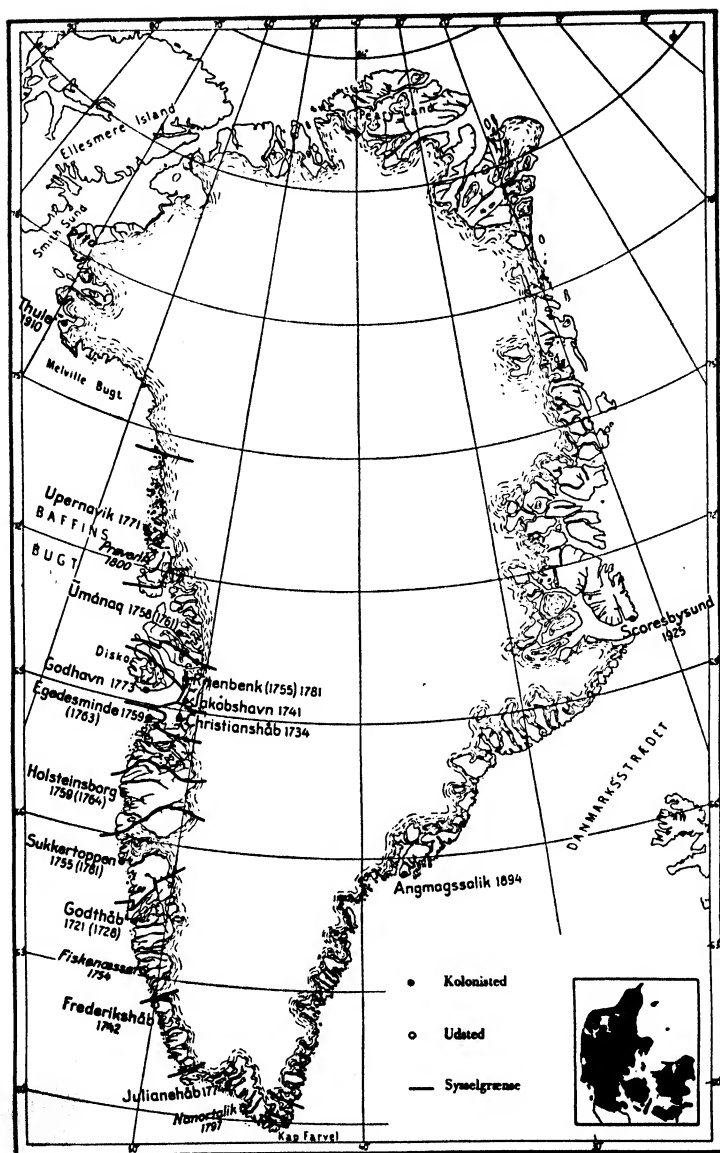


FIG. 1. This map shows the location and date of founding of the larger settlements in Greenland. The legend may be translated as follows:

*Kolonistad* is the administrative center of a county.

*Udsted* is a large village. There are in addition many smaller villages not shown on this map.

*Sysselgrense* is a county boundary, which in each case extends from the sea to the ice cap.

Reproduced from *Grønlands Bogen* by permission of its editor, Dr. Kaj Birket-Smith and the publishers, J. H. Schultz.

western part of Greenland, reaching from Upernavik at the southern end of Melville Bay in approximately  $73^{\circ}$  N. latitude, southward to Cape Farewell in approximately  $60^{\circ}$  N. latitude. It is along this coast that the modernization of Greenland has taken place, and it is here that plans for speeding up this development are being concentrated.

#### SURFACE AND MINERALS

About six-sevenths of Greenland is buried under ice, leaving at best a narrow strip of land exposed along the coastline. On the west coast, this never exceeds one hundred miles, and in places is reduced to practically nothing. Residents of Greenland, therefore, cling precariously to a small area of land between an ice cap up to 10,000 feet above sea level, and perhaps 7,000 feet thick, and the waters of Davis Strait. This strip of land is not continuous, since it is intersected by numerous fjords, and offshore is broken up into a very large number of islands, which in some places provide a "skerry guard" between the mainland and Davis Strait. Much of the west coast is of ancient rock, largely granite and gneiss, eroded into alpine-like features. There are, in the Disko area, more recent rocks including sandstone and limestone, with some coal measures included. The whole has been modified by glacial action, by subsidence, and later by emergence from the sea. Within the rocks which are readily exposed thru a thin covering of vegetation, some minerals of importance have been found, and the presence of others is suspected. Economically, the outstanding mineral is cryolite, found near Ivigtut, on the southern part of the coast. Coal of low quality is mined on and near Disko Island in about latitude  $70^{\circ}$ . So far, no other minerals, with the possible exception of marble at one time quarried north of Disko, are of economic significance.

#### CLIMATE

The climate of West Greenland is generally supposed to be Arctic, if one accepts the July isotherm of  $10^{\circ}\text{C}$ . ( $50^{\circ}\text{F}$ .) as being the criterion. There is, however, reason to believe that certain of the fjords in the southern part of the area have sufficiently warm summers to remove them from this classification. At Ivigtut the annual mean temperature is  $+5^{\circ}\text{C}$ ., but the temperature falls gradually until it is  $-9^{\circ}\text{C}$ . at Upernavik (and continues to fall to  $-13^{\circ}\text{C}$ . at Thule) in the north-west. Winter temperatures on the

west coast are not severe, with Ivigtut having a mean for the coldest month, February, of  $-7^{\circ}\text{C.}$ , and Upernavik  $-23^{\circ}$ . Winter temperatures may change frequently, due to the passage of air masses traveling from the west, or because fohn winds descend from the ice cap. The sea is generally unfrozen in winter as far north as Sukkertoppen, altho thin ice always forms at the heads of fjords and in small bays along much of the coast. Winter ice conditions vary considerably. In mild seasons coasting ships are able to reach as far north as Egedesminde in December. In only rare years is there continuous ice between Disko Island and the mainland at Egedesminde. The seaport, Godthaab, can be reached by ocean-going vessels thruout the year. Curiously enough, the worst ice trouble on the south-west coast is due to the heavy Arctic icepack swept northward around Cape Farewell. It originates in the Arctic Basin and along the East Greenland coast. This ice sometimes closes ports as far north as Godthaab in summer, and must always be taken into consideration at Julianehaab and near the southern fjords.

#### TRANSPORTATION—OLD AND NEW

Transportation within Greenland is necessarily influenced by these vagaries of the sea. There is practically no land transportation, except in winter time. Roads only exist close to the larger settlements, and they are very short. All communication, whether between the larger administrative areas or within them, is by small boat, schooner or steamship. North of Holsteinsborg, sledge traveling is possible in winter, but no sledge dogs are used or kept south of this town.

Aircraft have provided an important supplementary means of travel, especially during the war years, but there is at present no regular internal system of civil air transport. A large military airfield, B.W.1, operated by the United States Air Force is available for occasional use by Danish government planes. Another, B.W.8, was recently taken over by Denmark from the United States Air Force, while a third and smaller field at Marrak, near Godthaab also used by the United States during the war has been operated by Denmark for some years. Amphibious aircraft have been used in connection with several important expeditions. The two-year Pearyland Expedition which recently completed its work in the north-eastern corner of the country was originally put in the field

by Catalina aircraft, and was resupplied in the same way in 1949. The present writer, along with his family, reached Greenland late in October 1944 in an amphibious Canso airplane of the Royal Canadian Air Force. It landed on the sea at Godthaab, and also made use of wheel landings at air fields. The French scientific expedition at present wintering on the Greenland ice cap in  $75^{\circ}$  N. latitude used aircraft for parachuting additional supplies during the 1949 summer.

### THE NATIVE PEOPLE

There are about 22,000 permanent residents in Greenland, of

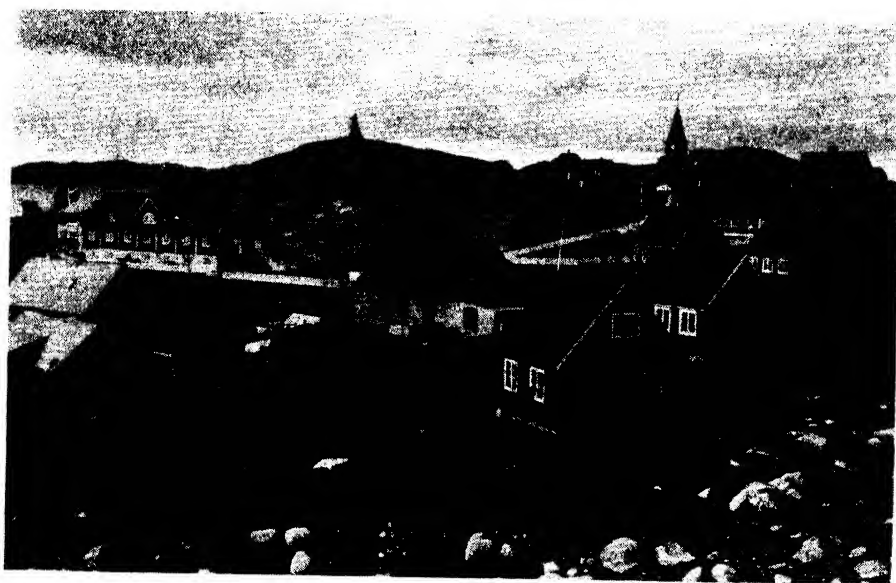


FIG. 2. Center of Godthaab, capital of Greenland.

whom about 1,500 live in two areas on the east coast and 400 in the far north-west. The remainder live on the west coast south of  $75^{\circ}$  N. latitude. The population has increased very rapidly in the past half-century, rising from a total of about 11,500 in 1900. The excess of births over deaths and the steadily increasing standard of health suggests that the total will continue to rise rapidly, thus placing an added strain on the already inadequate natural resources. These people are referred to as "Greenlanders," and are partially of Eskimo origin and partly of European. They use the Greenland version of the Eskimo language, but an increasingly large proportion of them are also able to use Danish.

Traditionally, the Greenlanders were hunters depending very largely upon the seal and other mammals, and to a smaller extent on fish, caribou and sea birds. The distribution of settlements, the equipment, clothing and housing of the people and their traditional skills, were all well-adapted to such an economy. The past thirty years have, however, seen an important change. A fall in the number of seals available, and a slight increase in the temperature of the sea water, which has brought the Atlantic cod and halibut into the coastal areas of West Greenland, has resulted in a change, so that today the Greenlanders are essentially fishermen preparing codfish, and its products, for the world market. He is no longer a hunter with a self-contained subsistence economy. It must be assumed that the increase in temperature of the coastal waters is temporary, and that, when it falls again, the cod will once more leave the area. In view of the change in customs and the loss of traditional skills due to the reduction in seal hunting, it is very doubtful if the economy can again revert to that formerly followed.

Farming on a small scale is becoming increasingly important in the southern part of West Greenland. Some natives have given up the sea and regard themselves as full-time farmers. Sheep rearing is of prime importance only in the fjords in the Julianehaab area, where there are about 20,000 sheep. During the 1948-49 winter, which was especially severe, there were for the first time heavy losses because of the weather. Wool is used locally and is also exported to Denmark. Much of the meat is consumed in Greenland but some canned products, as well as the sheep skins, are shipped abroad. It is interesting to observe how this development of farming has taken the Greenlanders from their villages along the outer coast into the inner reaches of the fjords to use once more the land colonized by Norse settlers a thousand years ago. Today, modern Greenlandic shepherds watch their flocks among the ruins of Norse churches.

Two long-term attempts have been made to breed foxes, but one has been given up. The official view appears to be that more is to be gained by guaranteeing a food supply to the wild foxes. Fish offal is used for this. The very high proportion of blue fox pelts found in Greenland increases the value of the catch.

Canning was first begun in Greenland on a commercial scale more than twenty years ago, when it was limited to Holsteinsborg, where halibut and shrimps were processed with Greenland labor.

This industry is now being expanded, and a very large cannery has just been completed in one of the southern fjords not far from Julianehaab. Other similar developments are probable in the next few years.

#### TRADE AND ADMINISTRATION

For nearly two hundred years the Danish economic and social policy in Greenland has been to maintain a complete government



FIG. 3. Children outside a village school.

monopoly of trade and employment, so that there has been no appreciable private importing or exporting of goods, and all prices have been fixed by government order. Thus Greenland has been, for a very long time, an example of a closely planned economy. This policy was followed and has been maintained in order to protect the native peoples from the damaging effects of intimate contact with predatory outsiders. It has undoubtedly enabled the Greenlanders to achieve their present stage of social well-being, health and cultural advancement without going thru many of the tragedies which have struck other primitive peoples. One reason why Green-

land is of especial interest today is that this traditional policy is being reviewed and radical modifications are likely to take place.

The Danish government, thru the Greenland Administration, has in the past purchased all the products of the country and shipped them to Copenhagen for sale. Conversely, the only stores in Greenland have been those operated by the government, which has deliberately restricted the variety of goods available so as to keep the demands of the residents near the bounds set by the meager resources of the country. The Danish government has at no time profited from its dealings with the Greenlanders and in many years a large deficit has had to be made up, either from a surplus on the mining of cryolite, or from the Danish national exchequer.

Greenland has been governed as a Danish colony. Administration has been thru an office of the Prime Minister's Department, and practically all of the administrative officials have been Danes. West Greenland has been divided into a dozen administrative Districts, each with a main administrative center. Each District has smaller settlements scattered thru it, and outlying hamlets. These Districts have been grouped into two main Provinces, one North Greenland with its capital at Godhavn on Disko Island, and the other South Greenland with its capital at Godthaab. The senior official in each of these has been a magistrate or governor reporting directly to Copenhagen. During the war years there was a single capital at Godthaab, since all contact with Copenhagen was impossible. Greenland was, in effect, administered by a small group of Danish officials, and administered exceptionally capably.

#### CULTURAL AFFAIRS

Education has been compulsory thru the elementary schools since the beginning of the present century, but this has only been really effective in the last thirty years. There is no illiteracy, since everyone is educated in his own language, Greenlandic. Beyond the elementary stage, Greenlanders may proceed thru a variety of schools, eventually reaching a seminary for the training of teachers, or a technical school, both of which lead, in special cases, to advanced education in Denmark. While the elementary education has always been in Greenlandic, high school education is increasingly being carried on in Danish. This change is in response to the pressing demands of the Greenlanders themselves. There are at present many Greenlanders in Denmark receiving academic, professional or vocational education, and every effort is being made

to fill administrative posts at the lower level with native-born candidates.

Since many Greenlanders are by tradition skilled craftsmen, it is natural that they should quickly adapt themselves to new local industries. A small shipbuilding yard has been operated at Holsteinsborg for twenty years, and there is now also a junior technical school there. The equipment is good, the training offered the boys is of high standard, and a proportion of them eventually proceed to Denmark for advanced instruction.

Greenland had its first printing press in 1860, when a native,

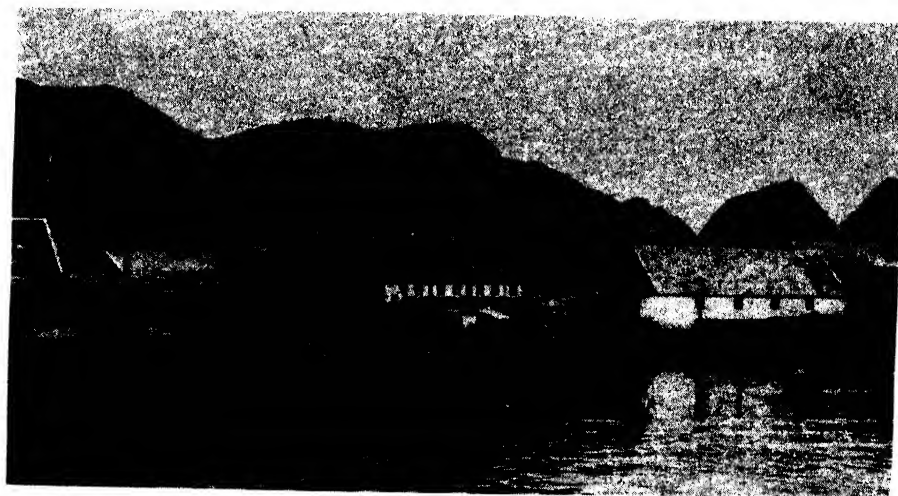


Fig. 4. A typically unsuitable town site, Sukkertoppen.

trained in Denmark, returned to Godthaab to edit and publish a small newspaper with a lithographic press. Modern equipment now produces, in addition to local newspapers, much of the printed material in the country, including school textbooks.

Radio has long been used for commercial communication. It is now also a cultural medium. Almost all the operators are native Greenlanders, and during the war years when traffic was very heavy, there was only one Danish operator in the country. It is hoped that radio and weather stations and similar technical operations will before very long be manned exclusively by Greenlanders.

#### RECENT CHANGES

The Nazi invasion of Denmark in April 1940, cut the Greenland Administration in Copenhagen off from the colony. The Danish administrators in Greenland had no alternative but to turn to

North America for supplies and for markets in which to sell the country's products. Trading contacts were maintained thru United States and Canadian Consulates opened at Godthaab and thru a selling agency in New York. There were very tenuous contacts with United States air bases and weather stations in Greenland itself, but otherwise the country was not directly influenced from North America. The temporary break with Denmark enabled the Administrators on the spot to develop techniques of local self-govern-



FIG. 5. High school class at Godthaab, Greenland. The native tongue is Greenlandic Eskimo, altho they also speak Danish.

ment much more rapidly than would have been possible otherwise. Consequently, after the war there came a demand, both in Greenland and Denmark, for reform in the Greenland administration. One result has been the appointment of a Parliamentary Commission to draft reforms for the country. With the close collaboration of leading Greenlanders, it is now evolving a new administrative, economic and social pattern for the country. The development of natural resources is certain to be speeded up, the education of Greenlanders, both culturally and technically, is being increased, and the government monopoly of trading is likely to be modified, possibly thru the establishment of cooperatives, for which Denmark has long been famous. Large sums of public money are being

spent on the scientific surveys necessary to make these changes possible; on the establishment of weather stations to aid aviation, the building of new harbors, erection of power stations, the modernization of fish processing plants, and on improvements in the educational system. In such ways it is hoped that the Greenland economy may be so strengthened that it can withstand any shocks due to changes in climatic conditions (leading to the retreat of the Atlantic cod) or to serious variations in the demand for Greenland products on the world market.

While sheep raising has become an important secondary occupation in some districts, and small-scale agriculture will probably spread, it is not believed that there can be any radical departures in the country's economy. Modern Greenland is as dependent upon the sea for its livelihood as was Greenland of fifty years ago. However, it is now able to use the sea's resources more efficiently, and with better equipment to tap sources farther from the coast, in this way raising the standard of living of the whole population.

The Danish government of Greenland has long been a model of disinterested colonial administration. The welfare of the native people has been the sole criterion of success. The country has been closed to non-residents (and is still closed) merely to protect its own people. As they have advanced in education, health and economic awareness, the time has approached when the barriers could be let down gradually. The next few years will undoubtedly see this change of policy being brought into effect by the Danish Administration.

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## BRINGING GRADE SCHOOL PROJECTS INTO THE COLLEGE CLASSROOM

ERNEST S. DIX

Miami University, Oxford, Ohio

Too much emphasis cannot be placed upon those college geography courses required or recommended for future elementary teachers. It is she, the coed in skirt, sweater, and saddle shoes, who will shortly be teaching Jack and Johnnie their geography ABC's. It is she, the future elementary teacher, who will set the general level of geographic understanding for millions of future Americans. In a few brief college courses how can geography be made so interesting and meaningful that our children will be insured, thru her, a

solid foundation in geography? These courses should be a challenge, not burdensome introductory classes to be presented by the least qualified member of the staff.

A device that can prove valuable in helping prepare the future elementary teacher for her work, is that of planning and constructing simple projects that she in turn may use in grade school situations. These projects take the form of displays and models designed to illustrate some phase of geography. Properly handled such projects win the interest of almost any grade school youngster. It is common knowledge that the amount of information a child assimilates is directly related to his interest in the subject. Creating with one's hands, especially creating things from an idea partly or wholly conceived by one's self may be just what is needed to stimulate the interest of grade children in any field of knowledge. Geography readily lends itself to such experiences. Geography reaches from the field and factory to the classroom door. There is geography in the meanest coal town, in the tiniest village in the wheat belts, as well as in the largest metropolis. Projects can help bring geography from the field and factory right into the classroom.

The elementary teacher however will be in a better position to supervise such projects if her training has offered the opportunity for planning and constructing one or more of them. Two weeks can well be spent away from formal textbook material in such practical application as projects afford. Several things must be constantly kept in mind when planning projects to be done in college courses.

1. Projects, altho done by college students, should be simple enough that grade school children could largely plan and construct projects by themselves. Overly complicated problems bring much delay, discouragement, and often end with the teacher doing most of the work. Construction of a mercurial barometer is fine for a high school science class, but is probably too difficult for the elementary school. A crude wind vane or rain gauge might be within the grasp of grade school children. In the college class, students are constructing elementary level projects; therefore, they should present a refined and finished product, much superior in quality to that expected of grade school children.
2. Projects should be inexpensive with most of the materials easily obtainable. Almost every home has old magazines and newspapers that can afford a fine selection of pictures and

clippings. Most farmers, merchants, company executives, etc., are happy to provide samples of products and frequently much additional material. Pasteboard, glue, crayons are cheap and are part of general school supplies. A model of the locks at Sault Ste. Marie with motors to open and close the locks as well as pumps to raise and lower the water level, might be fascinating but scarcely a project for which the materials would be either inexpensive or easily available.

3. Projects are designed for the study of geography. However, it is difficult for professional geographers to define the outer limits of their discipline, and in grade school certainly no time should be wasted in such an endeavor. If some history, government, or related subjects infiltrate the project, so much the better. It may thus serve to illustrate the interrelationship of various school courses and help to show teachers of other subjects the value of geography. A project on the importance of canals in the growth of your community may be as much history as geography—so be it.
4. Projects in the college classroom are used as demonstration units. It is desirable to have as many types of projects as possible. In this way, not one or two but many ideas for future use can be presented. In grade school, however, probably each child or group of children would work on similar projects.
5. Projects should be the student's, not the instructor's. In the college situation it is best to merely outline a variety of projects, but to add little specific instruction on how to proceed or what material to include or exclude. College students should be obliged to work out the projects for themselves, as they shortly will in actual teaching situations. Encourage original ideas; they may prove superior to many old and tried suggestions. In a recent class under my supervision, a completely original project was voted best, by the class. The more the work can be completely the student's, grade school or college, from the idea up, the greater will be the benefit derived.

A recent college class for future elementary teachers constructed projects using some of the suggestions embodied in this paper. At the outset the instructor presented a few possible project themes. Reference was made to the McKnight and McKnight publication, *Activities in Geography*, compiled by George J. Miller. The class was divided into teams of two, except in the cases of a few

individuals who preferred to work alone. A few tips on how to proceed were given, but for the most part the instructor had no idea of the project, other than its theme, until it was completed. At the final class period all the projects were assembled in one large classroom, some attached to the wall, others displayed on classroom tables, and others on bridge tables borrowed for the event.

To make the projects more valuable, each student or team of students had typed a description sheet which was placed near the project. These description sheets gave concise information about the project so that other students or the general public could quickly grasp what the project was depicting, and how it had been constructed. The description sheets followed this form:

#### DESCRIPTION SHEET

NAME OF PROJECT .....

NAME OF STUDENTS .....

GRADE LEVEL FOR WHICH PROJECT IS INTENDED .....

AIM OF PROJECT

(What the teacher hopes the children will gain from the project.)

METHOD OF CONSTRUCTION

(Detailed instructions for each step in construction.)

SOURCE AND COST OF ALL MATERIALS .....

With such detailed information other students would not find it difficult to reproduce any of the projects in the display. Such description sheets can be doubly effective if mimeographed and distributed to all members of the class so that each member may

have many specific project ideas to take into actual teaching assignments.

The exhibit included a wide range of projects. A partial list follows to illustrate the types of things the prospective teachers believed would lend themselves to use in grade school teaching:

1. *A Trip to Yellowstone*. This project included maps showing location of Yellowstone National Park, the roads thru the park, important scenic features in the park. It included actual photographs taken at Yellowstone by a member of the student's family and a small model of a scene in Yellowstone. This idea could be varied to illustrate any scenic area that pupils had recently visited. Estimated cost of project, \$.30.
2. *Jigsaw Puzzle of the United States*. Three jigsaw puzzle maps were made, one using plyboard, the others less solid materials more easily manipulated. One cost nothing, the second \$.75, and the third showed no estimate of cost. One student mentioned the fun fellow college students had with the puzzle. They found much to their chagrin that they didn't know as much about the United States as they supposed.
3. *Corn Belt Farm*. Another type of model, and one showing a much smaller area, was that of a corn belt farm. The college students, one of whom lived on the farm depicted, secured an aerial photograph of the farm and from it laid out on a large sheet of poster paper the outline of fields, woods, roads, and streams. They then painted these features so the model would appear like the aerial photo. A few buildings, fences, and trees were constructed from paper, matchsticks, and confetti, and properly located on the poster board farm. Samples of the crops grown in each field were placed in small paper dishes and put on the fields in which they were grown. Estimated cost of project, \$.35.
4. *Middletown*. While the Corn Belt Farm would be very useful in a rural community, a project more suitable for urban situations was done by a Middletown student. A map of the city was secured from the city engineer and reproduced on poster board. (For grade school children the map could be used directly.) Then the student studied leading industries and points of interest in the city, and with a camera made a tour of the city, taking representative photographs. The photographs were glued to the poster board and numbers were

entered on the city map to show the location of each picture. While only a limited number of grade children might have access to camera and film, pictures of most significant spots in a city could be found in old publications. Estimated cost of project, \$4.62 (Mostly for film and developing.)

5. *The Shenandoah Valley*. In this project the students simulated a television set by cutting an opening in a large pasteboard box. On a long strip of brown wrapping paper they pasted and drew pictures typical of the Shenandoah Valley. This strip was mounted on rollers so it could roll past the "television screen." Estimated cost of project, \$.35.
6. *The Solar System*. This small model, not done to scale, showed the planets and their satellites in relationship to the sun. The planets were of molded clay, their moons also of clay mounted on cardboard disks attached to the planets. Wires stretched into the distance to represent the orbits of the planets. Estimated cost of project, \$.40.
7. *Information and Products Map of Ohio*. A large map of Ohio (about 6 ft. x 6 ft.), showing the main highways, was equipped with models and pictures of factories, ships, scenic attractions, etc. In the words of the student who developed the project this is "How to Make It":

1. "Secure an old cardboard crate or box; slit the glued corner and open it up. As large a box as possible should be used. This will make suitable and inexpensive material.
2. Secure a road map of Ohio from a reputable gas station. Mark three inch squares on the map and nine inch squares on the cardboard. Draw an outline of Ohio on the cardboard by using the squares as a guide. Add the location of streams, lakes, principle cities, highways, and any other information you may desire.
3. Carve from soft wood, buildings, boats etc. Paint these and glue them to the large map in proper places.
4. Cut from magazines or any other source pictures of products you may wish to show and glue them to the areas to which they pertain on the map."

The student included these instructions for using the map:

1. "This map would be used in connection with the study of Ohio in the fifth grade.
2. The children can use it to help fix in mind the location of principle cities and what they are famous for by making 'motor trips' with the miniature autos, and then filling out the prepared 'tripsheets.'
3. Since all the work involved can be done by the children, the project can be correlated with mathematics and art. It may serve as an incentive for children to learn geography by having to make the map and build the cities.
4. Any child who knows of a town where he formerly lived, or where he has relatives can put this town on the map.

5. This map can be used to introduce a little fundamental road map reading, an art in which we need much practice.
6. The mileage chart at the bottom of the map may serve as a lesson in itself in reading graphs and charts.
7. The surrounding states are clearly marked. This will help fix in the child's mind Ohio's location in the country."

In addition to the map itself the student prepared "trip sheets" for use with the map. These mimeographed forms contained such questions as:

What highways did you travel on?  
How far did you go?  
In what direction did you travel?  
What rivers did you cross?  
What cities did you see?  
What are the cities famous for?

Children could be assigned a trip between two cities or locations on the map. They would take a toy auto and proceed to travel over the roads on the map to their destination, watching for rivers, towns, scenic features as they went.

Estimated cost of project, \$.45.

8. *Salt, Flour, and Water Relief Models.* Several models were constructed using a combination of salt, flour, and water plus some form of coloring. One represented the Great Lakes area, another Italy, and another depicted a spit, hook, baymouth bar, and an offshore bar. The Art Department might cooperate in such undertakings. Estimated cost of these projects, \$.35, \$.64, and \$.88.
9. *Miami Conservancy District.* The students made a large map of the area covered by this Ohio conservation district locating on it the rivers, the five dams with their retarding basins, and the main cities protected by the district. In addition several pages of explanatory material told why the district was established and how it is carrying out its program of flood control. Estimated cost of project, nothing.
10. *Ohio's Ten Largest Cities.* A large sheet of poster paper was cut in the shape of Ohio, and upon this map the ten largest cities of Ohio were located. An article characteristic of each city was placed on the table below the map with a string connecting each city with its product. Thus a cake of Ivory soap represented Cincinnati; a toy cash register, Dayton; etc. Estimated cost of project, \$1.25. (This included several items that ordinarily could be borrowed from the children's homes.)
11. *Buzzer Map of the United States.* A map of the United States

was traced, then painted, on a large piece of plyboard. An assortment of 24 significant rivers, cities, lakes, etc., were selected and electrical connections were made from the back of the board to a bolt extending thru the map to the proper location. The buzzer sounded when the correct location on the map was touched with a pointer at the same time that the name from the list at the sides of the map was touched with another pointer. This project was much more involved than most, and would have to be worked out by the teacher. There is no doubt however that it would be extremely popular with grade school children.

Estimated cost of project, \$6.72. (Cost included transformer so it might be used with ordinary 120 volt AC current.)

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In the college class, projects may be spaced thruout the semester or they may be assigned for completion upon a single date. If spaced thruout the semester, each team of students can present its project individually to the class. This will provide opportunity for class discussion and criticism that will aid in improving the project before the student tries it as a teacher for the first time. However, the projects may be completed on a single date. Then if desired the projects may be exhibited for the general public. In this way other students and faculty as well as interested townspeople, can see concrete evidence of the value of geography. In the grade school, rather than spacing the projects, it would be advisable to have all projects completed at the same time. Here, too, a public exhibition or display to which parents are invited would be valuable.

Is it worthwhile to bring grade school projects into the college classroom? This question was put before two classes who had recently completed such projects. They were almost unanimous in answering in the affirmative. Here are several of the reactions: "I know I personally gained a wealth of practical knowledge which isn't in texts." "... most worthwhile part of this semester's work." "It is something that I feel I can actually use in my teaching." "I began to see how a map of the type which I made could be integrated into other courses such as history." "It makes a prospective teacher aware of her resources (ability, money, etc.). It made me aware of what I can do if I will just try."

## THE REGIONAL STATUS OF LITTLE DIXIE IN MISSOURI AND LITTLE EGYPT IN ILLINOIS

ROBERT M. CRISLER

Washington University, St. Louis, Missouri

This paper is concerned with two controversial areas bordering the southern margin of the Corn Belt. Little Dixie is a twelve county area of 7,321 square miles, located between the Mississippi and Missouri rivers, in central and northeastern Missouri. Little Egypt is a sixteen county area of 6,160 square miles, between the Mississippi, Ohio, and Wabash rivers in southernmost Illinois (see map).

Both Little Dixie and Little Egypt are relatively unknown outside the areas themselves. They are almost completely overlooked in geographic literature. However, the contention is made here that they are not merely untypical parts of the Corn Belt which can continue to be ignored for the reason that they aren't typical of this recognized geographic region—the Corn Belt—in which they are usually included.

Both these regions are recognized locally and in some literature as possessing unity. Local recognition of the fact that one lives in an area different from surrounding areas may be a primary clue in establishing geographic regions particularly since cultural features as well as physical features are now recognized as geographically significant. In other words, it is suggested here that these two areas each may possess a significant degree of homogeneity warranting their recognition as geographic regions.

### ORIGIN OF THE NAMES

The people of these two regions do not consider themselves as natives of the Corn Belt. Use of the term Corn Belt is almost completely absent—totally unlike Iowa and Central Illinois where the Corn Belt Motor Company, Corn Belt this, and Corn Belt that are characteristic names for businesses. On the other hand, local names for the regions, namely Little Dixie and Little Egypt have arisen. In both cases the origin of the respective term is debatable. The term Little Dixie apparently was used for years among Missouri politicians because of the political unity of the region similar to that of the "solid South." Wide usage of the term developed just

before World War II. One daily newspaper in the area currently proclaims that it is published in Mexico, Missouri, the capitol of Little Dixie, while a banner over its want-ad section claims that its want-ads cover the field like the dew does Little Dixie. In 1948 an editorial quarrel involving four newspapers in four Little Dixie cities broke out over which Little Dixie city was entitled to recognition as the "Capital of Little Dixie." Mexico apparently retains the title despite the skirmish.

The term "Little Egypt" is undoubtedly older historically than the term "Little Dixie." The most commonly accepted explanation is that the term Little Egypt dates from a severe winter in 1830-31 followed by a late spring and short summer in Central Illinois. The resulting crop failures to the north caused frontiersmen to come south to Southern Illinois to buy grain. The name "Little Egypt" was applied because of the similarity of the famine in Canaan as related in the Bible when grain was obtained in Egypt. The other leading explanation for the term "Little Egypt" is simply that the area is somewhat delta-like in character and contains several Egyptian place-names such as Cairo, Thebes, Karnak, Dongola, and Delta. Today local pride encourages omission of the "Little" from "Little Egypt" thus referring to the region simply as "Egypt." At Murphysboro which calls itself the "Mecca City of Egypt" there are business firms such as the Egyptian Auto and Home Supply Company, the Egyptian Garden Roller Rink, the Egyptian Optical Company, and Egyptian Sales Agency. At nearby Carbondale, home of such enterprises as the Egypt Book House, Egyptian Venetian Blind Factory, and Egyptian Electric Co-op Warehouse, students of Southern Illinois University call their newspaper "The Egyptian," their yearbook "The Obelisk" and the school directory "The Sphinx."

#### DELIMITATION OF THE REGIONS

The problem of delimiting these two areas presents slightly different problems. Using local popular opinion as a primary clue there is some apparent difference in the desirability of being included in Little Dixie and Little Egypt. Congressman Clarence Cannon of Missouri in a letter to the author stated it this way: "Unlike the section known as 'Little Egypt' in Illinois which every local county insists is just over its border line, a large number of counties insist that they are within the 'Little Dixie' area." Others, however, might suggest the reverse to be true.

In the case of Little Dixie, there are fewer actual delimitations in print than in the case of Little Egypt. In fact, the author's delimitation of Little Dixie published in 1948 in the *Missouri Historical Review* is apparently the most widely accepted. Certain refinements based on detailed study appear in the author's dissertation (Northwestern University, 1949). This delimitation was based primarily on the fact that Little Dixie can be mapped as a political region—a stronghold of the Democratic party—and that this political unity closely coincides with local popular opinion as to the areal extent of Little Dixie.

Little Egypt on the other hand is probably better known but it has an extremely indefinite northern boundary. A regional magazine called the *Egyptian Key* defines Little Egypt as consisting of the twenty-eight southernmost counties of Illinois—those counties south of or crossed by the old Vincennes-St. Louis trace, the route now followed by U.S. Highway 50 and the Baltimore and Ohio Railroad. The vast majority of advertisers in this magazine, however, are from eight counties. Other delimitations suggest six, eleven, or sixteen counties. The latter appears to be the most acceptable at present.

#### SETTLEMENT OF THE REGIONS

In general both these two regions were settled before most of the remainder of the states in which they are located. Little Dixie was thoroly settled between 1801 and 1835. Little Egypt was settled somewhat earlier between 1700 and 1825. Both were settled primarily by southerners altho there were a few French settlements in Little Egypt before the southerners began arriving in large numbers after 1800. There was one important difference in settlement which influences the present-day cultural geography of these areas and helps provide for their respective regional unity. This was the fact that slave-owning southerners or at least southerners accustomed to slavery settled Little Dixie. Non-slaveholding southerners settled Little Egypt.

The Civil War accentuated regional unity. In Little Dixie almost all the inhabitants followed the "lost cause" and the area was policed by Federal troops recruited chiefly from surrounding areas. Twenty-three per cent of the people of Little Dixie in 1860 were Negro. Even in Little Egypt there was much sympathy for the Confederacy. There was talk of setting up "Egypt" as a separate state aligned with the South.



Dixie by Germans who arrived in Missouri in large numbers in the 1830's and 1840's, settled St. Louis and spread westward and northward from there.

Agriculture is the dominant economic activity. In terms of amount of land in farms, size of farms, value of farms, percentage of farmland in crops, amount of farm tenancy, types of farms, livestock units, and crops, Little Dixie is transitional between the agriculture of the Ozarks and agriculture of the Corn Belt. For example, O. E. Baker suggested in 1927 that the borders of the Corn Belt surround areas which produce over 3,000 bushels of corn per square mile. Today, Little Dixie simply cannot qualify. Individually, three Little Dixie counties can barely qualify.

The transitional nature of agriculture in Little Dixie reflects the physical characteristics of the two adjoining areas. The Ozarks are characteristically hilly, unglaciated, forested, and relatively low in fertility. The Corn Belt is characteristically level, glaciated, prairie, and relatively high in fertility. In other words, with respect to physical environment, Little Dixie has some features like those of the Ozarks and some like those of the Corn Belt. But the physical features that Little Dixie shares with the other two regions are, in Little Dixie, in combinations that are distinct from the combinations of features that hold for these adjoining areas.

#### GEOGRAPHIC REGIONALITY OF LITTLE EGYPT

In the case of Little Egypt the regional unity is different from that of Little Dixie. There is little political unity here inasmuch as there are strongly Republican counties as well as strongly Democratic counties. Little Egypt is more of a transition zone between the Cotton Belt and Corn Belt with respect to such cultural features as political attitudes of the people. Instead of eight institutions of higher learning, Little Egypt has only one. Likewise, with respect to Negro population, whereas the average of six and one-half per cent is almost as great as in Little Dixie, there is little homogeneity since the majority are in the three southernmost counties which produce cotton. However, in contrast with most of the rest of Illinois, Negroes are confronted with the problem of segregation in schools and elsewhere thru most of Little Egypt.

With respect to population, Little Egypt contained 386,809 people in 1940 with a population density twice that of Little Dixie. Thirty-six per cent of the people live in cities, a figure almost identical with that of Little Dixie. There are larger, more strategically

located cities on all sides such as St. Louis, Cape Girardeau, Paducah, and Evansville, again a similar situation to that found in Little Dixie. This is a real clue to Little Egypt's regionality as distinct from the regionality of the Corn Belt because without large cities, the region nevertheless has continued to increase in population rather than decline.

Further research leads to the conclusion that the present day regionality of Little Egypt is best expressed in the term "economic distress area" meaning a region essentially overpopulated in relation to the current economic opportunities available. Economic distress was particularly pronounced during the depression years of the 1930's and is again evident in 1950. Unemployment and practically all forms of public aid are high and in direct contrast to the rest of Illinois. The contrast with the rest of Illinois, of course, emphasizes the regionality.

Agriculture and coal-mining are the dominant economic activities. There are local specialties such as peaches and apples in Union and Jackson counties, popcorn in Gallatin County, cotton in Alexander and Pulaski counties, and fluorspar in Hardin County. General farming and coal mining, tho, dominate the region. Just as in Little Dixie, the majority of the counties, eleven of the sixteen do not provide sufficient corn per square mile to qualify as true Corn Belt counties.

Various groups have given attention to the possibility of developing forest resources and recreational facilities in Little Egypt. The region is better suited for such development than the rest of Illinois but is less suited to it than areas surrounding Little Egypt outside Illinois. There are seven state parks in Little Egypt as compared with two in Little Dixie.

As in Little Dixie, the transitional nature of agriculture in Little Egypt reflects physical conditions of surrounding areas. In the case of Little Egypt, this involves not only the Corn Belt to the north, and the Ozarks to the west but the Cotton Belt to the south, the Pennyroyal (Highland Rim) to the southeast and southern Indiana to the east.

Mention should perhaps be made that each region has had a native son who became a famous humorist and author. The writings of Little Dixie's Mark Twain are undoubtedly known by every reader of this article. Little Egypt's H. Allen Smith published a book in 1947 titled *Lo, the Former Egyptian* concerned with a

return to his home-town of McLeansboro. However, he is better known nationally as the author of *Rhubarb*, *Low Man on a Totem Pole*, and *Life in a Putty Knife Factory*.

### CONCLUSION

Thus, Little Dixie and Little Egypt are not typical of the Corn Belt. Both have characteristics common to the Corn Belt but also have characteristics common to other surrounding regions. Little Dixie has a pronounced political regionalism which is distinctive. Little Egypt is a distinct economic distress area. These regions are not large but not so insignificant that they can be ignored. There must be geographic unity here, otherwise the regional designations, Little Dixie and Little Egypt, would not find such widespread popular usage.

The immediate future of Little Egypt and Little Dixie apparently lies in the further emphasis of livestock farming and dairying instead of corn farming. Of the field crops, soybeans and hay crops may utilize a greater percentage of the crop land in the future. Certain specialized crops such as popcorn, peaches, and apples in Little Egypt may continue to do well and production may even be increased. Rice has been successfully introduced in the Mississippi River bottoms of eastern Little Dixie. Tobacco growing has almost completely disappeared from both areas.

Mining cannot be counted on to be of any greater importance in either region than it is at present, and while these areas have some favorable locational features attractive to certain types of manufacturing, locational factors in general provide little promise for any rapid development of these areas for industrial purposes.

The position of Little Egypt in the otherwise rich agricultural and industrial state of Illinois has caused the problem of Little Egypt's future to receive somewhat greater attention than the problem of Little Dixie's future. In Missouri, the problem of the future of the Ozarks overshadows the problem of the future of Little Dixie. However, in the case of both Little Egypt and Little Dixie, proposals for developing recreational facilities and forestry must take into consideration the fact that neither region can or should move as far in that direction as is possible in the Ozarks.

## THE NATIONAL COUNCIL AT WORK

The program for the thirty-sixth meeting of the National Council of Geography Teachers at the Edgewater Beach Hotel, Chicago, on November 24 and 25 follows. The Executive Board will meet at 2 p.m. Thursday afternoon, November 23.

**Friday, November 24, 1950**

**9:00 A.M. First General Session**

**East Lounge**

*Presiding*, Loyal Durand, Jr., President, National Council of Geography Teachers; Department of Geology and Geography, University of Tennessee.

*Greetings* to the National Council, Mamie L. Anderzhon, William Beye School, Oak Park, Illinois.

*Response*, Villa B. Smith, Second Vice-President, National Council of Geography Teachers; John Jay High School, Cleveland, Ohio.

*Alaskan Problems and Potentials*, Kirk H. Stone, Department of Geography, University of Wisconsin, Madison, Wisconsin.

*Geography of Education*, Edna E. Eisen, Department of Geography, Kent State University, Kent, Ohio.

*Collecting and Visualizing Precipitation Data*, Thomas F. Barton, Department of Geography, Indiana University, Bloomington, Indiana.

*Potential Uses of Government Libraries*, Arch C. Gerlach, Maps Division, Library of Congress, Washington, D.C.

*The UNESCO International Seminar on the Teaching of Geography as an Aid to International Understanding*, Montreal, Canada, July 12-August 23, 1950.

Panel by the four official delegates of the United States Government: Zoe A. Thralls (Chairman), University of Pittsburgh, Pittsburgh, Pennsylvania; Thomas F. Barton, Indiana University, Bloomington, Indiana; Marion H. Seibel, School 52, Buffalo, New York; Sister Mary Ursula Hawk, St. Columba's Convent, Johnstown, Pennsylvania.

**State Coordinators Luncheon**

**12:15 P.M. (Open Meeting)**

**Marine Dining Room**

**Friday Afternoon**

**Section 1. Panel by a Group in Geographic Education**

**East Lounge 2:00 P.M.**

*Presiding*, Villa B. Smith, John Jay High School, Cleveland, Ohio.

*Proceedings and Findings of a Study Group in Geographic Education*. Presented by some of the members of the Southwestern Pennsylvania Study Group in Geographic Education.

Panelists: Katherine Montgomery (Chairman), Geography, Grades 7 and 8, Greensburg, Pennsylvania; Corinne Cowan, Geography, Grade 4, Greensburg, Pennsylvania; Helen Sampson, Geography, Grade 5, Carroll Township, Washington County, Pennsylvania; Aldine Patterson, Geography, Grades 6, 7, and 8, Franklin Township District, Greene County, Pennsylvania; Eugenia Baxter, Geography, Grades 7 and 8, Carroll Township, Washington County, Pennsylvania; Secretary, Pennsylvania State Council of Geography Teachers; Allene Walker, Geography, Grades 7 and 8, Chartiers Junior High School, Washington, Pennsylvania; Mary L. Griffith, Geography, Senior High School, Canonsburg, Pennsylvania; John Enman, Jr., Department of Geography and Geology, Washington and Jefferson College, Washington, Pennsylvania; Erna G. Gilland, Consultant in Geography Education and Curriculum Coordinator, California, Pennsylvania.

**Section 2. High School and College Geography**

**Sheridan Room 2:00 P.M.**

*Presiding*, Harry O. Lathrop, Department of Geography, Illinois State Normal University, Normal, Illinois.

*Geographic Concepts in High Schools*, Ruby M. Junge, Division of Education, Michigan State College, East Lansing, Michigan.

*Status of Geography in Colleges*, J. R. Schwendeman and Arthur Grove, Department of Geography, University of Kentucky, Lexington, Kentucky.

*The Use of Radio as a Teaching Aid in the Social Sciences*, Harry J. Vander, III, Texas State University, Houston, Texas.

### Section 3. Mathematical Geography

South Terrace 2:40 P.M.

(Joint Session with Central Association of Science and Mathematics Teachers)

*Presiding*, Laura L. Watkins, Lincoln School, Cicero, Illinois; Chairman, Geography Section, Central Association of Science and Mathematics Teachers.

*Geography Among the Sciences*, Otis W. Freeman, Head, Department of Science and Mathematics, Eastern Washington College of Education, Cheney, Washington; Formerly, Specialist for Geography in Higher Education, Office of Education, Washington, D.C.

*Mercator Projection: Its Practical and Pedagogic Merits*, Clarence L. Vinge, Department of Geology and Geography, Michigan State College, East Lansing, Michigan.

*Mathematical Scale Problems*, Edward B. Espenshade, Department of Geography, Northwestern University, Evanston, Illinois.

*The Place of Astronomy in a Geography Curriculum*, James K. Anthony, Department of Geography, Tennessee A and I State College, Nashville, Tennessee.

*Election of Officers*: Following completion of this joint session the members of the Geography Section of the Central Association of Science and Mathematics Teachers will convene for a business session to elect 1951 officers.

### Section 4. Gamma Theta Upsilon

American Room 3:30 P.M.

*Presiding*, Warren Strain, Department of Geography, State Teachers College, Slippery Rock, Pennsylvania.

*Secretary*, Ina C. Robertson, Department of Geography, State Teachers College, Valley City, North Dakota.

*Growth of the Fraternity and Problems of the Vice-President*, Thomas F. Barton, Department of Geography, Indiana University, Bloomington, Indiana.

*The Proposed New Constitution*, Panel, Veva K. Dean, State Teachers College, East Stroudsburg, Pennsylvania; Ovid M. McMillion, Wilson Teachers College, Washington, D.C.; Mary Jo Read, State Teachers College, Milwaukee, Wisconsin.

Election of Officers.

### Annual Banquet 6:30 P.M.

Michigan Room

Announcement of the Richard Elwood Dodge and Ray Hughes Whitbeck prizes.

Presentation of the Distinguished Service Award.

*Address*, Dr. George H. T. Kimble, Director, American Geographical Society of New York, *The Role of Geography at the Mid-Century*.

### Mixer 9:30 P.M.

East Lounge

The National Council of Geography Teachers and the Central Association of Science and Mathematics Teachers will hold a joint mixer in the East Lounge immediately following the two separate banquets.

Saturday, November 25, 1950

### 9:00 A.M. Second General Session

East Lounge

*Presiding*, Harry O. Lathrop, First Vice-President, National Council of Geography Teachers; Department of Geography, Illinois State Normal University, Normal, Illinois.

*Some Geographic Contributions to Conservation Education*, Wesley Calef, Department of Geography, University of Chicago, Chicago, Illinois.

*Learning Readiness in Elementary Geography*, George T. Renner, Department of Geography, Teachers College, Columbia University, New York, New York.

*Civilization's Most Valuable Resource, Leaders: Wherefrom and Why Therefrom*, Stephen S. Visser, Department of Geography, Indiana University, Bloomington, Indiana.

*The Global Distribution of Primary Governmental Types: its Significance and its Claim for Inclusion in a Geographic Curriculum*, James R. Beck, Department of Geography, Kent State University, Kent, Ohio.

**10:40 A.M. Conservation Section (Joint sectional meeting with the Central Association of Science and Mathematics Teachers)** **Sheridan Room**

*Presiding*, Edward Ray, Conservation Education Consultant, Michigan Department of Conservation.

*A History of the Great Lakes Area*, Helen Martin, Research Geologist, Geological Survey Division, Michigan Department of Conservation.

*Reforestation and High School Biology*, Lida Rogers, Holland Senior High School, Holland, Michigan.

*How to Present Conservation in the Elementary Grades*, James M. Sanders, Department of Science, Chicago Teachers College, Chicago, Illinois.

**12:15 P.M. Luncheon (groups free to make plans)**

**2:00 P.M. Fourth Annual General Assembly**

**East Lounge**

**(Attendance at this meeting is restricted to members)**

*Our Thirty-sixth Year*, M. Melvina Svec, State Teachers College, Oswego, New York.

*Financial Status of the National Council*, John H. Garland, University of Illinois.

*The Planning Committee*, Katheryne T. Whittemore, State Teachers College, Buffalo, New York.

*Field and Travel Experience for Teachers*, Pauline Schwartz, State Teachers College, New Haven, Connecticut.

*National Survey of Geography in the High Schools*, Lillian E. Worley, University of Tennessee.

*New Committees; UNESCO Contacts*, Loyal Durand, Jr., University of Tennessee.

*In Appreciation*, Mary Viola Phillips, New Kensington, Pennsylvania.

*A New Administration*, Alice M. Foster, University of Chicago.

*Prospects for 1951*, Harry O. Lathrop, Illinois State Normal University.

*Revision of the Constitution*, Clyde F. Kohn, Northwestern University.

*The WOTP World Convention*, Edna G. Gilland.

LOYAL DURAND, JR., *President*

## GEOGRAPHICAL PUBLICATIONS

**Executive Committee on Southern Illinois. Southern Illinois.** The University of Illinois Press, Urbana, Illinois. 1949. 193 pages, 70 figures. Paper-bound, \$2.00; Cloth-bound, \$3.00.

The sixteen southernmost counties of Illinois cover an area of 6,160 square miles in the very heart of the Mississippi valley—roughly 500 miles from Minneapolis or New Orleans or Pittsburgh. To those who automatically think of Illinois as almost synonymous with Corn Belt these southern counties have geographical features which must come as a shock. Less than 30 per cent is level land (having less than a 2 per cent slope) whilst one county has as little as 8.4. Out of the 400,000 people more than a quarter depend upon agriculture and forestry, nearly a sixth on mining and only a tenth on manufacturing. Fundamentally the land is poor and the development of specialist types of farming such as the growing of apples, peaches and vegetables is rendered difficult by distance from markets as well as lack of capital. Consequently the Committee on Southern Illinois came into being to study the complex problems involved and agreed that their first objective should be to make a complete and objective inventory of the resources of the area and to appraise their present state of development and utilization. Twenty-eight authors have combined in writing this well produced and well illustrated report which resulted. Professor T. F. Barton (now of Indiana) contributes the brief but adequate first chapter on Physical Geography (including climatology) in which the basic physical difficulties of the region are stressed—the ill-drained clay pan soils of the glaciated north and the swampy flood-plains of the south alike present problems. Climatically most of the area has 190 days without killing frosts and the extreme south over 210. In the account of history and culture Mr. J. W. Allen points out that the people are descended from “plantation-minded settlers from the south-eastern states” and so are culturally very different from the people further north. In an interesting study of population trends the conclusion is reached that this is an area producing more young people than the existing economy can support and hence with an urbanward and out-of-state migration.

A group of authors is responsible for the agricultural picture and stresses the low crop yields and the marked dependance on livestock products despite the existence locally of conditions highly suitable for intensive horticulture and a high reputation for early apples. Forest and mineral resources are considered in detail. Coal is present in abundance: the two problems are transportation to consuming centres and the competition of the well-known low volatile coking coal of the east more immediately suitable for such purposes as metallurgical coke than the high volatile Illinois coal.

In turn water resources, wild life, recreation, transportation and varied aspects of business and industry are fully considered and the whole forms a survey which is in many ways a model of its kind. It remains basically objective, tho the Committee gives its summary and recommendations in the first section of the book. The essential need is seen to be the creation of more and diverse opportunities of employment by introducing manufactures, restoring idle land by tree-planting, modifying and improving farming practice and development of recreational facilities.

*University of London*

L. DUDLEY STAMP

**Marion I. Newbigin, Third Edition revised under the editorship of R. J. Harrison Church. Southern Europe: A Regional and Economic Geography of the Mediterranean Lands.** 404 pages, 103 maps and diagrams. Index. E. P. Dutton & Co., Inc., New York, 1949.

This revision of the well-known earlier editions of *Southern Europe* by Dr. Newbigin presents a timely interpretation of post-war trends in Switzerland, Italy, the Iberian

Peninsula, Greece and Albania. Preceding the fourteen chapters devoted to the above countries are three general chapters dealing with the Mediterranean Sea, structure and relief of land-forms, climate, vegetation and land utilization. Mr. Church, as editor of the third edition, has called upon specialists of the various countries to deal with recent changes while maps and diagrams, which include new boundaries, are correct as of 1947.

The physical geography, strongly emphasized in the book, has been little changed from the first edition, and serves as a background for the integration of the human geography. Following the discussion of the different political units is a statistical summary with a well-documented bibliography for additional readings.

Universities and colleges that do not offer a course dealing exclusively with southern Europe will find the book valuable as a supplementary text for a more inclusive European geography course or as a reference book. This book, as a text, is of sufficient depth to challenge advanced students of geography while other students will likewise find it helpful in many problems of southern European geography.

*Indiana University*

E. A. STONEMAN

## EDITORIAL NOTES AND NEWS

Rear Admiral Edward H. Smith, director of Woods Hole Oceanographic Institution reports that the Gulf Stream meanders far from its supposed course. In fact this ocean current sometimes doubles back on itself and at other times looping in such a way that it creates vast eddies which break off from the stream.

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Have you read "Conservation Education at the Secondary Level" by J. Russell Storey and "The South Looks to Its Resources" by Richard L. Weaver? Both of these articles are in the October, 1950, issue of *School Science and Mathematics*.

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What is the relationship between geography and the social studies? Before geography teachers attempt to answer this question they should be sure they are up to date on the newer definitions of social studies. Have you read some of the recent ones? The following on the teaching of the social studies in the elementary schools is taken from a book published in 1950: "The social studies, strictly defined, are those portions of history, geography, civics, and other social sciences that are selected for use in teaching. As used by an increasing number of elementary-school workers, however, the term is more inclusive, 'coming to include within its compass contributions from many and varied subjects—the social sciences, art, literature, music, and even some phases of science.' In conformity with this tendency in usage, 'social studies' as used in this volume will connote greater breadth of content than is customary when used in secondary schools and colleges.

"The term 'social studies' 'most emphatically . . . does not refer to a particular kind of organization' and 'cannot properly be limited to any scheme or type of fusion or integration.' For example, the term may be used to describe the content of history and geography when offered as two separate and distinct subjects, and also when they are combined and merged as in a study of a local community. It will be assumed throughout this volume, however, that most elementary schools will find it more practicable in terms of economy of time, simplicity of curriculum organization, and effectiveness of learning to unify social studies as much as possible."

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Have you seen the new map of South America compiled and drawn in the cartographic section of the National Geographic Society and released with the October, 1950, issue of the *National Geographic Magazine*?

# *The* JOURNAL of GEOGRAPHY

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VOLUME XLIX

DECEMBER, 1950

NUMBER 9

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## PUERTO PEÑASCO, SONORA

RONALD L. IVES

### INTRODUCTION

Only a generation ago, Puerto Peñasco was a little-visited harbor on the Sonoran shore of the Gulf of California, serving as a port of call for a few fishermen, adventurers, and fugitives from justice. Land access was over a perilous 60 mile desert trail from Sonoyta, or an equally arduous desert traverse from Altar. Resident population was five, and there was only one permanent building.

Today, with construction of a large emergency landing field (1941), paving of a two lane highway to Sonoyta and Ajo (1946), and completion of the Sonoran Railroad (May 5, 1949), Puerto Peñasco has become a bustling community of 2,500 persons, supported by their work in the transportation and fishing industries. Population growth is rapid, market demand for refrigerated fish exceeds the current supply, ship building and repair work is in demand, and conditions are improving rapidly. In consequence, Puerto Peñasco has become a modern city of hope on the western bastion of the arid and unproductive Sonoran Desert.

### PHYSICAL ENVIRONMENT

Location of Puerto Peñasco with respect to terrain and to the present Mexican and international transportation networks is shown in Fig. 1, a summary map from which minor details have been omitted.

The harbor, which makes the port a desirable anchorage, is a small embayment, protected on the north by Rocky Bluff, an ancient lava island, 400 feet high, tied to the mainland by a bar almost five miles long. General appearance of this tombolo is

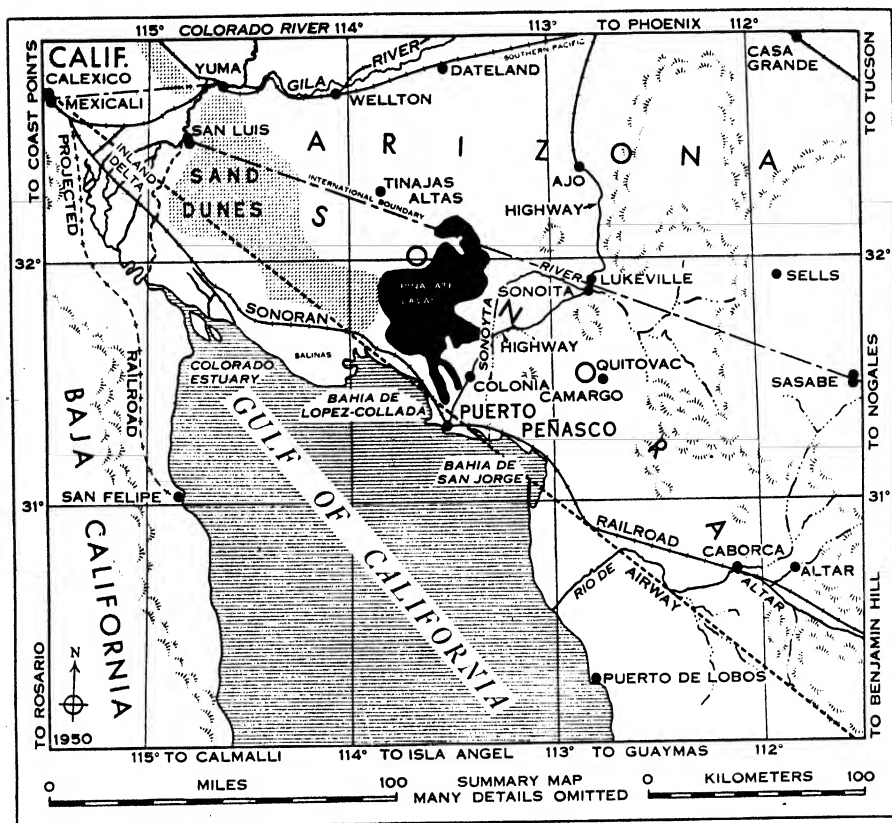


Fig. 1. Summary map of the area bordering on the head of the Gulf of California, showing location of Puerto Peñasco with respect to terrain and transportation routes.

shown in Fig. 2. The other shore of Rocky Point Bay (Bahia de Punta Peñasco), is formed by Rocky Point, a lava-capped hill of sand and gypsum, with a rock core, having a summit about 225 feet above sea level.

A shallow inner basin, isolated from the main bay by a curved elevated bar (Fig. 4, beach), fills at high tide, and is used for small boats and ship repairs. Man-made harbor improvements consist of a mole and a breakwater, arranged to give shelter to small boats.

South of Puerto Peñasco, for more than 20 miles, the Sonoran shore extends eastward, and is composed of a narrow beach bar, with a few lagoons behind it; a wide shelf, extending inland for several to many miles; an ancient shoreline, about 75 feet above the present beach; and an inner-belt of desert deposit. The straight

shore of Sonora, south of Puerto Peñasco, is an almost barren desert, with no regular human habitations, no dependable water, no roads, and no resources. Even the desert-loving Seri Indians shun this region, which, until the recent development of the jeep, was almost impassible. General appearance of this barren and mirage-shrouded region is shown in Fig. 3.



FIG. 2. View of Rocky Bluff, an ancient tombolo, or tied island, from the south shore of Rocky Point Bay. Rock beach in the foreground is basaltic lava, eroded from Rocky Point, above Puerto Peñasco. Note ancient elevated shoreline on west (left) side of Rocky Bluff.

Temperature ranges at Puerto Peñasco are typical of the Sonoran Desert Region, with maxima of about  $130^{\circ}$  F. in summer, and minima of about  $30^{\circ}$  F. in winter. Average ranges are about fifteen degrees less, and daily ranges are about 35 degrees. Because of low relative humidity during the hotter parts of the year, and of a strong and fairly regular land-and-sea-breeze cycle, summer conditions at Puerto Peñasco are not unpleasant. In winter, flannel shirts and coats are desirable, but danger of frostbite is about nil. Rainfall is in the form of one or two violent summer squalls; with a quiet drizzle once or twice during the winter. Annual rainfall is about 5 inches, with great year-to-year variations.

Tropical hurricanes, altho not uncommon in the Gulf of California, rarely reach Puerto Peñasco, and cause little damage when they do, as a result of natural shelters, particularly Rocky Point.

## FLORA AND FAUNA

Altho the hinterland of Puerto Peñasco is a desert, composed of sand dunes, gravel-floored valleys, and lava flows, it is by no means devoid of life. Almost every acre of Sonora, with the possible exception of some parts of the salt flats ("Salinas," Fig. 1), supports some life. Much of the area is covered by sparse clumps of sage, with occasional screwbean trees, and clumps of grease-wood. North and east of Puerto Peñasco groves of giant saguaro

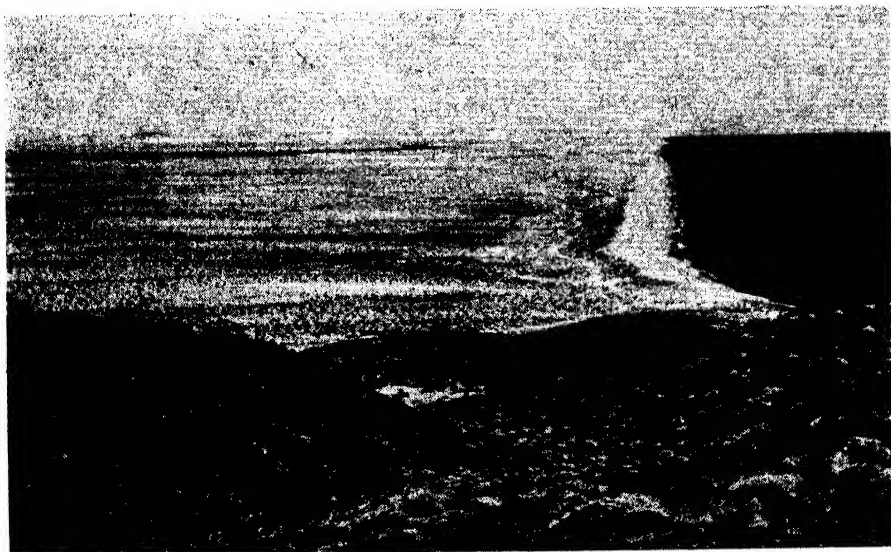


FIG. 3. The vast and arid "despoblado" south of Puerto Peñasco. Foreground material is black lava, forming the caprock of Rocky Point. Shore of the Gulf of California, with its wide beach, extends eastward for more than 20 miles. A small lagoon, perhaps the ancient drowned mouth of the Sonoyta River, interrupts the desert in left middle distance. Bases of the mountains, on the horizon, almost 70 miles away, are hidden by mirages.

cactus tower to heights as much as 30 feet. Along the ephemeral streams of the region, cottonwood trees are common, sometimes defining the dry channels for many miles.

Numerous insects, of varying rapacities, are prevented from overrunning the area by large numbers of small reptiles, mostly lizards, which prey upon them. Small rodents, many of them related to the ground squirrel, subsist on the grasses and cacti of the region, and in turn are eaten by the larger carnivores, of which coyotes are representative. Mountain sheep and wild donkeys are

the largest wild animals in the region, altho a few javelina are present. These are preyed upon by the local mountain lions and bobcats, both of which are hunted by men.

Birds include the Gambrel Quail, various hawks and buzzards, gulls, and a number of very small birds, such as the cactus wren, the cliff swallow, and at least two varieties of humming bird. A few horned owls and prairie owls have been seen in the region, but may be migrants or fugitives from other areas.

Unlike the land areas of Sonora, which are steppe and desert, most of the Gulf of California is populated to the limit of its supporting power by fishes of all kinds, many of them unclassified. Dense banks of seaweed furnish ample food for the smaller fish; these in turn are eaten by the larger fish, and also by seals and marine birds. Whales are not common in the Gulf of California, but Seri legends tell of a period of great prosperity in the past, "the year of the big fish," when a whale was stranded on Tuburon Island, and the Seris operated a meat mine for several months. Plentiful marine life in the Gulf of California supports the local fishing industry. In a few areas, notably at Bahia de Lopez-Collada (Fig. 1), shallow sea areas are separated from the Gulf by temporary sandbars, and here the waters become too foul to support marine life. Such euxine areas are commonly short-lived, but new ones are created by the same currents that disrupt the old ones.

#### TRANSPORTATION NETWORK

Transportation facilities to and from Puerto Peñasco are shown in Fig. 1, with a summary of terminal conditions in Fig. 4. At the present time, there is daily stage service to Sonoyta, with connections to Ajo (Arizona) and Gila Bend. Rail service consists of one passenger train daily each way to Mexicali, on the International Boundary; and three trains weekly each way to Benjamin Hill, on the railroad from Nogales to Hermosillo, the capital of Sonora. Freight service depends upon amount of material to be shipped. Sea transit is irregular, and is determined by demand. Air service over Puerto Peñasco is regular, but landings are made only in emergency. Charter air service to Puerto Peñasco from Mexicali, Nogales, and Hermosillo is available at standard rates.

Much passenger and freight traffic in this area is carried by non-scheduled vehicles, such as trucks, chartered ships, and planes.

Navigation aids at Puerto Peñasco consist of a lighthouse atop Rocky Point (Fig. 4) and a course beacon near it. Radio facilities are maintained at the airport and the Oficina de Comunicaciones. Despite isolation and high cost of equipment, the navigation aids at Puerto Peñasco are kept in excellent operating condition, due almost entirely to the diligence of the local residents.

### CITY LAYOUT

Puerto Peñasco is an excellent example of a well-located community which has outgrown its site. The original town, now locally known as "Fishing Town," occupies a narrow bench on the north-west side of Rocky Point. This bench is probably an ancient shore-line, much like that on Rocky Bluff (Fig. 2). Upon the summit of

Rocky Point, directly above Fishing Town, and easily accessible from it, is the lighthouse and the aeronautical course marker (Fig. 4). General appearance of the older part of Puerto Peñasco, which is now the administrative and commercial area, is shown in Fig. 5.

Because the original townsite was too small for the population and activities of the port, Puerto Peñasco has expanded onto the desert in every possible direction, and new segments of the city have grown up about various

other centers of activity. The recent completion of the railroad led to the construction of the Railroad Town (Fig. 4). Local ship repairs and building necessitated a small group of buildings near the yards, which line the west side of the inner basin (Fig. 4, 6), and work related to road transportation led to construction of a modern Motel east of town. About this has grown up another settlement, locally called Motel Town, and occupied largely by freighters, mechanics, their families, and their local suppliers.

Already, a few houses have been built on the road leading to

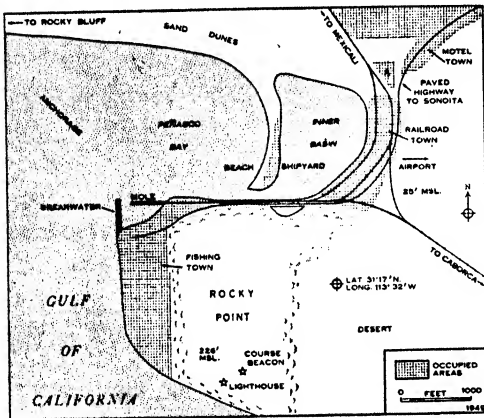


FIG. 4. Sketch map of Puerto Peñasco, drawn from photographs, showing subdivisions of the community, interrelations of transit routes, and major terrain features.

the airport. Shortly, if present growth continues, particularly if the projected Mexicali-Peñasco-Hermosillo feeder airline begins operation, there will be a new section of the city—Airport Town.

At present, many of the buildings in Puerto Peñasco are of only one story, and many of these are temporary structures of wallboard and matting. This temporary housing is being replaced by sturdy one and two story buildings of concrete blocks as rapidly as the supply of concrete blocks permits.

New building construction, in general, is accompanied by some improvement of the building site, usually leveling, and bringing



FIG. 5. Older part of Puerto Peñasco, seen from the crest of Rocky Point. Here are concentrated the administrative and commercial functions of the city. Peaks on horizon are Sierra Blanca (right), and Pinacate Volcano (left). A part of the Motel Town is visible in upper right. Note shallowness of Peñasco Bay, in middle distance.

the lot to local grade. Some terracing of Rocky Point has already been done (Fig. 5), and low areas near the breakwater and mole (Fig. 4) have been filled in.

As should be obvious from the map (Fig. 4) the present layout of Puerto Peñasco is almost entirely functional, and, altho the community "just grewed," it would be hard to improve upon the present relation of city plan to local topography and activities. It would, of course, be mechanically feasible to dig away much or all of Rocky Point, thereby enlarging the building area near the Fishing Town, but the highland is more useful as an elevation to support navigation aids, and, in the future, a reservoir. In conse-

quence, no effort is being made in this direction, altho residences may well be constructed on the summit in the near future.

### ECONOMIC ACTIVITIES

There are about 2,500 people in Puerto Peñasco at present, and, of these, about 800 are gainfully employed. The remainder are wives and children. There appear to be no unemployed in the community; and no unemployables. Those who have no money and don't want to work avoid Peñasco—it is more pleasant to loaf elsewhere!

Major industries in Puerto Peñasco are fishing, transportation, and the various service industries related to them. About 50 vessels, of various sizes, are engaged in fishing at present in the Gulf of California near Puerto Peñasco. To process the catch for shipment, a medium-sized modern processing plant has been constructed on the shore, and an anchorage (Fig. 4), consisting of a mole and a breakwater, has been constructed on the south side of the bay, close to the plant, for convenient unloading of the smaller vessels and tenders (Fig 7). Present plans call for the construction of a long pier, on the site of the present mole, in the near future, so that unloading will be facilitated. Fish from Puerto Peñasco are sold not only in Mexico, at points accessible to the railroad, but as far away as Los Angeles, California, and Phoenix, Arizona. Projected improvements in the refrigerating plants will make possible regular shipments to Denver.

Because there is no agriculture near Puerto Peñasco, and no local water supply, transportation is a vital community function. Bulk foods, from Mexicali and Hermosillo, are brought in by rail. Surplus farm commodities from the Sonoyta area find a ready market in Peñasco, to which they are trucked over the paved highway. Some manufactured items are imported from the United States via Gila Bend and Ajo; others come in by rail.

All water used at Puerto Peñasco must be imported. Some is brought by rail, but most of this is required by the railroad installation, which is quite large, as Peñasco functions as a division point and maintenance center. A small amount of water is distilled from sea water, a costly process, using imported fuel, and reserved for acute emergencies.

Most of the city water is trucked in from Colonia Camargo, on the Sonoyta Road, a haul of about 12 miles. At Colonia Camargo

a deep driven well, tapping a buried aquifer which may be the sub-surface flow of the Sonoyta River, supplies potable water in considerable quantities. Installation of a gasoline pump and storage tanks there has facilitated loading of water trucks. When the pump is shut down, it is sometimes necessary to go to Sonoyta, some 70 miles from Puerto Peñasco, for water.

Because Puerto Peñasco is a "turnaround" point for most



FIG. 6. Newer parts of Puerto Peñasco, photographed from the summit of Rocky Point. In foreground is the shipyard, on the inner basin. A small sector of the beach of the outer harbor is visible at the extreme left. In middle distance is a part of the Motel Town, and to the right of it is the paved highway to Sonoyta. White houses on far side of inner basin, to right of road (A in Fig. 4) are new, air-conditioned houses for railroad personnel. A small part of the railroad town is visible in extreme right. Pinacate Volcano is on horizon at left; Sierra Blanca in center.

vehicles, and a division point for railroad employees, there is a relatively large hotel and restaurant business. Altho lacking plush carpets, potted palms, and uniformed bellhops, the hotels of Puerto Peñasco function admirably, supplying clean beds in quiet rooms at moderate rates. The restaurants cater to people who must work for a living, and furnish good simple food at reasonable prices. Attempts are being made, with some success, to attract winter tourists to Puerto Peñasco, where the climate is quite pleasant, and the deep-sea fishing excellent.

### SOCIAL ORGANIZATION

Altho Puerto Peñasco is a new, and rapidly growing, community, having many of the economic aspects of a boom town, it does not suffer from the lawlessness and disorder characteristic of such communities in the early days of the settlement of the United States. The inhabitants of Puerto Peñasco are busy, orderly, and polite. The culture is definitely northern Mexican, even tho as many as ten different languages may be heard in the course of a day, and features and complexions indicate many racial origins. Perhaps the age and economic status of the inhabitants influences the nature of the community. In contrast to the young single men who established many of the cities of the western United States, many inhabitants of Puerto Peñasco are middle-aged, married, and financially stable, having attained some economic success in some other community before moving to the new seaport. Some of the residents are grandparents.

Administration at Puerto Peñasco is typical of many smooth-running Mexican towns, with a Comisario, Police Department, Postmaster, and Jefe de Comunicaciones performing all major governmental functions. The present city administration (1949) is quite obviously trying to do a good job, and is succeeding, with strong popular support.

Nautical functions are controlled by the Captain of the Port, who is responsible not only for recording the comings and goings of the various ships, but also for the care and maintenance of the navigation aids, the customs collections, and the multiple problems of harbor maintenance and improvements.

Education is an important city function, and is carried on in a newly-built school, which is already crowded with students. The teaching apparently is excellent, for many of the students can do complicated problems in foreign exchange without difficulty, and most speak English, as well as Spanish, clearly and correctly. Due to the success of the Mexican campaign against illiteracy ("analfabetismo"), most residents of Puerto Peñasco are not only literate, but very well informed.

Municipal health is quite good, as a result of the inherent ruggedness of the northern Mexican, aided by careful local sanitation, and the efforts of a resident physician. Altho water is scarce and expensive in Puerto Peñasco, buildings are kept very clean by sunlight, air and diligent sweeping.

Amusements are not numerous in Puerto Peñasco, nor are many needed, for the average resident must work hard for a living. Films are shown regularly, these being brought in by rail and bus from central Mexico, and from Los Angeles. Many residents own radios, and listen regularly to stations in both Mexico and the United States.

Small gatherings customarily meet in the local saloons, which function as a "poor man's club," much as does the English Public House. Both soft and hard drinks are served here, as well as food. Music is provided by juke-boxes, or by local talent, some of which is very good.

Business is conducted in a businesslike manner, most stores having standard prices for standard items. Stocks of merchandise



FIG. 7. Unloading fish from a tender in the small boat harbor behind the mole and breakwater at Puerto Peñasco. Western gulls, attracted here by "free eats," are both numerous and tame.

are quite good, and service is excellent. Most of the merchants try hard and successfully to send the customer on his way happy; and business ethics are high. Prices are reasonable, in view of the isolated location of Puerto Peñasco. Items manufactured in Mexico are sold for about the Hermosillo price plus cost of transportation; and items from the United States are sold at about the Phoenix price, plus haulage cost. Because of the exchange differential, imported items cost almost ten times as much as comparable items "Hecho en Mexico" (exchange is currently 8.5 pesos for one dollar).

## FUTURE NEEDS AND PROSPECTS

As nearly as can be determined from personal observations, augmented by conferences with a number of community leaders, Puerto Peñasco is socially and economically healthy, despite its very rapid growth. Present growth rate suggests a population exceeding 5,000 by 1960.

In common with most other communities, Puerto Peñasco will soon be faced with a number of problems, solution of which may be quite difficult and costly. Chief of these, and the only one which may restrict the growth of the community, is the water shortage. The present supply, while adequate for immediate needs, is costly, and comes largely from one well—fortunately a good well, and carefully maintained.

Until more water is available, and at a low price, installation of running water in most of the houses at Puerto Peñasco is not economically feasible; and, without running water, a modern sewer system is impossible. Construction of a large reservoir atop Rocky Point will make possible gravity water supply to all buildings in the city, but some means must be found for filling that reservoir. At present (1950), no local water supply is known, and the well at Colonia Camargo cannot be pumped at a fast enough rate to supply a municipal waterworks, with its accompanying waste of water, much of it unavoidable. Present per capita water consumption in Puerto Peñasco is approximately five gallons per day, according to the water haulers. In most cities where water is piped to the houses, per capita consumption exceeds 200 gallons per day.

Coupled with the municipal water supply problem is the need for irrigation water, so that agricultural production will be possible from the arid, but potentially fertile, flatlands east of the city.

Search for underground water sources is being conducted by the Mexican Geological Survey, but the outlook for a discovery of such water nearer the city than Colonia Camargo is not encouraging. If plentiful water is found, even at a greater distance, a pipeline may furnish a costly, but workable solution to the water problem.

Harbor improvements needed to double or triple the capacity of the port are few, simple, and relatively inexpensive. Primary need is for a pier, to replace the present mole. This may be con-

structed with Government assistance, because of the strategic importance of the port. When traffic warrants, the inner basin (Fig. 4) can be converted to a tidal basin by installation of a single lock, and a small amount of dredging, the spoil from which could be used to fill in a number of low places adjacent.

#### SUMMARY AND CONCLUSIONS

Puerto Peñasco is an interesting example of the conversion of a potential resource—the fisheries of the northern Gulf of California—to a productive resource by construction of proper transportation facilities. Because the natural resource is real, and not imaginary, and the transportation facilities—a railroad and a road—function as planned, the resultant rapid growth of the city is exactly what might be expected. Present indications are that this growth will continue, and that a moderate-sized tourist industry will augment municipal income from fishing and related occupations.

From a national viewpoint, this development of Puerto Peñasco is extremely desirable, for it supplies homes and gainful occupations for several thousand citizens, furnishes a convenient division point on the Sonoran Railroad, and changes a part of the Sonoran Desert from a food-importing “despoblado” to an exporter of foodstuffs, largely fish, which are in demand in other parts of Mexico, and which are salable for scarce dollars in the United States.

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## PETROLEUM IN RELATION TO CURRENT PROBLEMS—I. SHOULD AMERICAN PETROLEUM IMPORTS BE RESTRICTED?

NELS A. BENGTON

University of Nebraska, Lincoln

In peace as in war petroleum, the raw material for products essential for power and for industrial uses, continues to hold premier position. As of January 1, 1950, the estimated proved petroleum reserves of the world were 77,702,250,000 barrels of 42 gallons.\* By "estimated proved reserves" is meant the petroleum believed to be recoverable from underground storage as indicated by wells drilled within pools and areas now productive. Proved reserves do not include untested areas nor do they imply proved in a definite and positive sense because even within so-called proved areas dry holes are often encountered. Nevertheless the estimates published represent the consensus of leading students, officials and statisticians actively at work in the industry.

This estimated world reserve is widely scattered over the earth from Tierra del Fuego to northern Alaska and in an east-west wide band around the earth. Altho petroleum is known to occur in every grand division, its uneven distribution has given rise to petroleum-rich and petroleum-poor countries. While the nearly 78 billion barrels of estimated proved reserves are the aggregate of at least 43 countries, only nine of them comprise the "inner circle," each credited with more than one billion barrels. These nine petroleum-rich countries named in order of their estimated proved reserves as of January 1, 1950, are, (1) the United States, (2) Kuwait, (3) Venezuela, (4) Saudi Arabia, (5) Iran, (6) Iraq, (7) U.S.S.R., (8) Canada, and (9) Indonesia. On a hemisphere basis, the estimated reserves are divided almost equally, 39,202,450,000 barrels being credited to the eastern hemisphere and 38,499,800,000 barrels credited to the western hemisphere.

Insofar as present data tell the story there is within each hemisphere one great center of known petroleum reserves and a few important lesser centers. In the eastern hemisphere the foremost center is in the Persian Gulf area including Saudi Arabia, Kuwait, Iraq, and Iran, while the flanks of the Caucasus and the Indonesian

\* Most of the data presented in this discussion were published by the *Oil and Gas Journal*, issues of December 22, 1949 and January 26, 1950.

islands may be considered as the principal satellite centers. In the western hemisphere the foremost center of accumulation is in the plains area of the United States with satellite or lesser accumulations in Venezuela, southern California, and Alberta, Canada. In this résumé it will be observed that the eastern hemisphere includes six of the billion barrels plus countries while only three of the major group are in the western hemisphere. However, taken collectively, the foremost area of estimated proved reserves is the Middle East credited with 32,413,000,000 barrels while second place is held by the United States with reserves estimated as of January 1, 1950, at 25,909,000,000 barrels. Altho the United States has consistently provided from 60 to 70 per cent of the world's production during more than three quarters of a century, there still are within its borders about one third of the presently estimated world reserves of petroleum.

#### IMPORTS NECESSARY

In the United States the demand for petroleum products is so great that, even with production of crude oil reaching five million barrels or more daily, imports of crude to the extent of 400,000 to 500,000 barrels per day have become ordinary practice. In 1949 the imports of crude oil and refined products averaged in excess of 600,000 barrels daily. Since the capacity for production in this country is such as to supply most if not all the market demands, the problem of imports has become one of wide interest. Some favor restrictions or high import duties while others favor free and open competition among domestic producers. Congress is being urged by strong pressure groups to take action, each group acting largely on the basis of self interest. The public should consider rationally the basic factors involved, among which the following may be named.

In the first place it is apparent that production in the United States cannot long be maintained at the present rate of two billion barrels or more per year. If no new discoveries were to be made in this country our stores of liquid petroleum would become exhausted within fifteen years. New discoveries will be made, are now being made, and we should therefore not become suddenly alarmed at the prospect of early depletion. Nevertheless, oil in the ground when once taken out is not restored. Oil is not a self replenishing asset and hence the need for conservative use. Foreign oil will lengthen the life of American reserves.

### PUMP WELLS

There is, however, another side to the picture. In this country a large percentage of our current production is supplied by pump wells with low daily production per well. At the close of 1949, the *Oil and Gas Journal* reported the total number of producing oil wells in the United States as 420,695 with average daily production of about 12 barrels per day. Six states, with a total of 135,578 wells, reported average production of less than 6 barrels per well per day. The daily average output of the 55,627 wells reported in Pennsylvania was only .6 barrel per day. To many people oil is a magic word, symbolic of wealth. They do not realize that oil involves heavy costs of production just as truly as does production of corn or cotton, and that costs must be met and some profits made or production will not be maintained. Furthermore if the hundreds of thousands of low yielding stripper wells were not maintained in production the reserves represented by them would become dissipated and lost. Therefore a reasonable price for crude must be maintained or we shall be in danger of losing a steady and dependable source of production of a vital national power resource.

Thus we face the problem of encouraging imports of crude petroleum as a need for American industry and also to prolong the life of our reserves. On the other hand, if we permit imports from the flush production of the Middle East or Venezuela in such quantities and at such low prices as to discourage continued production of our own pump or stripper wells, we would suffer irreparable loss. The problem of maintaining the proper balance between American domestic production and imports from foreign sources is one that involves consideration of the various geographic, economic, and political factors involved without losing sight of the conservation ideal—the best use for now and the future.

For classes in high school or college the question of limiting imports of petroleum by high duties or by quotas should be met fairly and openly. Propaganda either for or against must be avoided, and this can best be done by encouraging students to see that there are contrasting points of view, each with some facts to support it. As a result of such studies differences of opinion will probably develop, but each student should be able to defend his own view rationally and also to understand why others may differ with him.

## ARE YOU A MALTHUSIAN?

### A Review and a Bibliography of Recent Readings

RODERICK PEATTIE

Ohio State University

I have been reading books and articles on the coming scarcity of food and the almost startling increase of the world's population. Being a geographer I have had it called to my attention since I began studying in 1910, but the recent publications gave me fresh concern. It was Malthus that first said that food would normally increase in a mathematical ratio while population would increase in a geometrical proportion. Moreover, we have had since called to our attention that there is a limit to food production as the tillable land becomes completely settled. As an example, may I say that in Japan the level land used for rice paddies is decreasing in extent as they are using it for building houses for the extra population. The argument that starvation is facing the world is supported today by a group of thinkers known as the Neo-Malthusians, a group with sadly pessimistic minds.

Trained geographers, and I am not properly trained in economic geography, are versed in the array of facts brought out by the Neo-Malthusians. Agricultural experts have been calling to our attention that land has been decreasing thru erosion or being worn-out as exemplified by Jacks and Whyte in *Our Vanishing Lands* and Ward Shepard in *Food and Famine*. As head of the O.W.I. in South Africa, I was in contact with Hugh Bennett. After surveying the countryside, he gave the South Africans but 25 years before soil erosion would devastate the country to an extent where they would be in want of food.

#### ROADS OF EXTENSION

I was particularly shocked by reading William Vogt's *Road to Survival* and yet in reading it a second time I realized it was too pessimistic. And moreover, many of his statements did not take into account the measures that we are taking to preserve our food supply. His arguments are spotty and incomplete. Of Latin America on which he is best informed he says the continent is, except for 3 or 4 countries, overpopulated but he does not name them. This is true but the South Americans are behind in culture. He

fails to note that the main problem of that continent is the South Americans.

I am particularly interested in Africa. Vogt's treatment of Africa is incomplete and I suspect because he has a slight knowledge of that continent. Perhaps he is right in stating Africa will not support many more people. It did have a tremendous acreage of waste land, I can testify from personal observation, not only because of aridity but because of infertile soils. I saw huge areas of little use in food production. But, he does not know Africa and particularly the work of the British, Belgian and French agricultural agents, and what is being done to improve things. The British on the east and west coasts are doing grand work, tho by different means on the two sides. In the fine farming area about Salisbury in Southern Rhodesia I was shown excellent corn fields and was told that 95 per cent of them were contour plowed, a record that the United States for a similar area does not hold. The great concern with Africa as a food supply is there are four blacks to one white and the blacks are maturing to a position where they can take over the reigns of government. They then will save themselves from a diet of under nourishment and there will be less food for export. Sara Gertrude Millin, a South African whom I know, states this fear in the October, 1949 *Foreign Affairs*.

I suspect Vogt has read only very generally of China. We as Americans have made a significant improvement in China's food supply. In plant breeding, production per acre, and pest control, we and the Chinese have accomplished much. Buck in his "Fact and Theory about China's Land" in *Foreign Affairs* for October, 1949 tells briefly of some of the steps taken.

In describing India, Vogt has a right to be pessimistic tho it is proved that India can enlarge its food production by careful and scientific methods. Margaret Bourke-White in her *Halfway to Freedom* tells of the terrors involved with migrations in forming the two countries and lays the strife to religious wars. The real source, I am convinced, of the hatred and slaughter, is a struggle for land and food. But Vogt gives to us, if not the whole picture, a startling one that should surely make us thoughtful of the future. In a sense he is right. We have thoughtlessly wasted soil resources and we are increasing in numbers and the need of soil.

I was better pleased with Fairchild Osborn's *Our Plundered Planet*. In a sense the book is a more literary volume. But tho in

less detail than Vogt, it is nevertheless pessimistic. Osborn is also of the school of Neo-Malthusians. It is interesting, for example, what he says about Greece. Osborn notes that Greece had forested mountains, ample water supply, and productive soils to an extent that it had a high civilization. Twenty centuries after that we were forced to give to ruined Greece a loan of several hundreds of millions of dollars to aid its economy to prevent the Communists from taking advantage of its poverty. But the loan can never be paid back. The loan was made under political pressure but without an adequate consideration of the poverty of the land and the quality of life in Greece. It is a country hardly larger than Ohio and has a population equal to that state. But in Greece only 20 per cent of the land is tillable today. There is less than one acre per person, whereas 2.5 acres are considered necessary to maintain a European standard of living. And the soil is poor. None of that tilled land has the original top soil. Crops are grown on subsoil and only 11.5 bushels of wheat to the acre. Twenty-five to forty bushels are grown on other European fields. Moreover, the water supply is inadequate due to the depletion of the forests. The cutting of centuries, the burning of the forests and overgrazing by sheep and goats have brought destruction to the hillsides. And there is no wild-life left in Greece, a customary source of food.

In normal times Greece was forced to import one-half of its bread stuffs and three-fourths its rice; paying for it with tobacco, wine, currents and olive oil. These last three could have well been used at home. In the meantime, Greece was increasing in population until it had 770 persons per square mile of tillable land. We can not afford to permanently feed Greece. It is almost a hopeless problem.

Much of the Malthusian philosophy is said to have begun with Adam Smith (1776) and John Stuart Mills (1848). But Mills did not understand the remarkable expansion that began in 1800. They believed in a classic concept that everything was in a static condition, that there was a definite limit to resource production and a scarcity at that. And furthermore they saw in agriculture a law of diminishing returns. We still have that law in a textbook in economic geography which I am teaching today. It is only partially true. But not only with the new land of the Americas, Africa and Australia, they did not understand the revolution in agriculture

where Europe can raise as much as 40 bushels per acre where they used to grow 10. In 1898, Sir William Crooks said, "England and the civilized countries have not enough to eat" and that an increasing acreage of wheat land will feed the increasing population of the world, till 1931. Was he right? A recent statement in the *New York Herald Tribune* said that the dollar problem in England is in part because there are too many mouths to feed. On the increased acreage for wheat, one should consult O. E. Baker in a carefully written article in the JOURNAL OF GEOGRAPHY. Benjamin Franklin was worried about the food with which to feed the world and Jefferson in writing to Madison said, "When we get piled up one upon another—we shall become corrupt, as in Europe, and go to eating one another as they do there." What would Jefferson think of India today?

Of course, the Malthusians did not prophesy correctly for the next century. Not only did the production of food increase but there was not the increase of population in Europe that was expected. New lands were opened up, releasing millions in Europe as in North America, South America, Australia and Africa. At the beginning of the century the United States was still taking vast numbers of hungry people off Europe's hands, and we were sending one-fourth of our wheat and ship-loads of cattle to Europe. And we were optimistic as to the future. But are we today? Are we Neo-Malthusians or not? Louis Bromfield is not a Neo-Malthusian. In an article in the *Atlantic Monthly* of 1949 entitled, "We Don't Have to Starve," he is happy about the food future. In a way he is right. We of the United States do not in the near future have any need to fear, even if two-thirds of the world is hungry. But students in reading thought of Bromfield as far too optimistic in the article.

Let us face some facts before we make an answer.

#### POPULATIONS ARE SERIOUSLY INCREASING

Considering first, population growth, I have found that the estimates vary considerably. If I am challenged on my figures in any case I am right in saying that they are amazing.

In 1600 there were perhaps only 500,000,000 people alive in the world. By 1800 the population had increased twofold. There are about as many people in Europe today as there were in the world in 1600. It is estimated that there will be 500,000,000 increase in

world population in 25 years and the total world population would be about two and one-half billion.

In the United States, with a comparatively low birth rate, we are increasing at a rate far over 10 per cent a decade. A recent news item states it was a 20 per cent rate in the last 9 months. Certainly in a century we will have doubled our population unless we grow less sentimental about having babies. I would say that I am contributing to this increase. I recently have produced three grandchildren and I am at the prime of life and I have only begun my stride in producing grandchildren. China and India will double their population in 100 years and without my help. The United States has now two and one-third acres of tillable land to support a person. India has but two-thirds of an acre for the same purpose or one-seventh of the area we have. What will be the history of food nutrition in India? Already they are slaughtering off people as there is not enough food for all. China has 2 million people starving today. This is not a special year of poor crops but a normal year. The answer is not enough land.

Japan has 2,532 people to the square mile of available land, the Netherlands have 2,085, Norway has 1,660 and the United States but 221. About one-half of the Japanese are farmers but we must remember that the country also depends upon fish from the sea. Japan's 76 million are increasing at the rate of 1 million yearly. The U.S.S.R. in a century may have 400 to 500 million. They have the highest birthrate of all, about 40 per thousand people. India has 30 and the United States only 16 to a thousand, in spite of my personal efforts to build up the second generation.

J. J. Spengler in an article "The World's Hunger—Malthus, 1948," in the *Proceedings of the Academy of Political Science* gave a remedy for over-large populations. The remedy is birth control, capital formation, diffusion of science and engineering knowledge, and the removal of civil and international strife. The article is an excellent one and has a large bibliography. Mr. Spengler is an economist of Duke University and like all economists can not write without using the world capital. By capital formation he refers to an industrial development which will enable a country to purchase more food. But in the world picture according to the Neo-Malthusians there shortly will be no surplus to export. The removal of civil and international strife is important. I have only to mention China as of today or to take an example better known

to us, Germany. The significance of science and engineering is great. It saves me from being classed as a Neo-Malthusian.

#### REMEDIAL WRITINGS

We are leaders in engineering from an agricultural point of view. Our national and state governments are the best in the world on preaching to the farmer the need of soil conservation, the betterment of crops and the improved techniques of farming. They have even reached the economists. Harold J. Moulton in his excellent book on *Controlling Factors in Economic Development*, 1949, gives a summary of the efforts of the United States to grow more food and to increase our standard of living. True we are one of the best fed nations of the world today, along with certain other countries, mainly some of the British dominions but definitely we are interested in the future. The book, however, is explaining the basis of a national prosperity. Again, being an economist he goes into an explanation of national economics as a changing thing rather than a static concept held by the old school. Not being an economist, I follow the idea thru with difficulty. But he is against the law of diminishing returns in agriculture. In the last century because of machinery he notes that in terms of increase in the output per man per hour is equal to all the centuries put together. The law applies to an extent in intensive cultivation of the land. In the growing of wheat we were using 50 to 60 hours of man hour labor to an acre of land in 1830. By 1930 we were using less than 8 hours for the same operation. For corn there was a savings of 50 per cent. Tho costs do not primarily concern us, the increase of dollar costs between 1900 and 1940 increased 90 per cent. This gets him to the question of capital and like all economists is off on a favorite subject.

The interest in more production of the land is great and is the object of investigation by agricultural engineers the world over. The United Nations Scientific Conference on Conservation and Utilization of Resources had 500 papers by men of 50 nations. The list of papers covers every conceivable resource. Agricultural economists and agronomists say that food is in increasing amounts and capable of untold increase. The American Association for the Advancement of Science held a conference in 1940 to that end. Incidentally at that meeting it was claimed that with better varieties of rice and agriculture in China and India, these countries

would feed 56 million extra people. Bradfield in an article on "Soil Productivity and the Potential Food Supply of the United States" says that our country can feed 50 per cent more of a population and it will support with an increased acreage and an agriculture of the future, a population double the present numbers with a standard comparable with ours. His is a remarkably worthwhile one to read. His article appears in the *Proceedings of the Academy of Political Science* and is a worthy one.

Soil conservation is definitely a first step to be taken in regards to our securing proper amounts of food. Our soil is such an important natural resource that in a socialized democracy such as we have today it is of prime importance. When I was in South Africa in 1945 I was talking to farmers, and the talks frequently went to the question of soil erosion. I could tell them in those days that 145,000 acres daily were added voluntarily to county soil organizations which guided and indeed forced soil erosion prevention on their members and you could travel from Virginia to Texas without setting foot on land that was not under such organizations. The movement came into being while the Democratic Party was in power, but it was a more deep-seated activity than a party policy. I am a Democrat and I entered the state of Vermont some twenty years ago, where I bought a farm, a lone Democrat among Republicans. I had an eroded field, the north field. Farmers would come by, Republicans all of them, and looking at the field, complained that I was not planting trees to prevent erosion. I was busy with other things but in the end their arguments won and I planted trees. I did not have a right to waste the national resource even to the slight degree of a couple of gullies. By preventing the erosion I was admitting that the land was not mine but that I merely had the right to use the land according to national needs. In a manner I was curtailing my privilege of private enterprise and I was approving further socializing of the government in regard to natural resources. Many of my critics voted largely on the basis of preventing any interference with their private enterprise but were unconsciously agreeing to it.

I need not tell you of the destruction of the country's soil that has gone on by erosion. I lived for a time on the Mississippi Delta and the river day in and day out was carrying the fine top soil to the amount of huge trains constantly rolling to the sea. In addition to the references I have already cited, I would refer you to the

standard work of H. H. Bennett entitled *Soil Conservation*. For those who want easy reading on the subject I suggest Louis Bromfield's "Soil Conservation" in the *Proceedings of the Academy of Political Science*.

Bennett says, "We have some land left that has not been used; but it is scattered. We have no large aggregates of land to which we may turn. We are losing every day as the result of erosion the equivalent of two 140 acre farms. We have lost that much since we were here yesterday. It is gone, gone forever. . . ."

Let me present a single fact from C. Lester Walker, *Man and Food—The Lost Equation*. He says that 75 million acres in Indiana, Ohio, Pennsylvania, Kentucky and West Virginia have been developed to corn culture and have suffered greatly from erosion. Annually they would have lost less than 3 tons to the acre and that would be replaced by natural soil farming processes. But these fields largely on hillsides were losing the startling amounts of 99.3 tons per acre. I have been on fields in the Cumberland Mountains which produced corn only for 3 years after they were cleared. Fields were exemplified by Walker as having produced 69.5 bushels to the acre but with the top soil gone would only give less than 20 bushels.

But Bradfield notes that even tho soil has been farmed by soil-depleting crops as in the Eastern United States, that experiments have proven that these depleted soils can be built up to a fertility which is above the original virgin soils.

Besides the loss of soils physically there is a decreased fertility. This we can build up. Malabar Farm has been built up by Bromfield. He points out that we have not utterly destroyed our land as have the Asiatic and Mediterranean countries but can develop our farms to a reasonable productivity. He has built up Malabar Farm to a marvelous degree. An example is of his meadow supporting a cow and a half to an acre for 6 months pasturage and on the other side of his line fence a farmer needs six acres to support one cow. On the other hand he is against the use of excess chemical fertilizers which he claims can be destructive to good farming. Rather he is for animal fertilizers, the growing of legumes which give nitrogen and the plowing of straw and waste under the ground. We are using sewerage more than we used to and Europe is likewise using it. But despite advances in agricultural techniques the world's soils are diminishing in fertility. It is true

we concerned ourselves over the problem. I believe it was William Allen White who said no money was ever made out of our farms except as we dug into the principal.

Of course, there is the program of increased acreage as a remedy. Canada and Siberia are examples. But these northlands will be limited in the amount of food they can produce. There are the jungle lands. Earl Parker Hanson in his *New World Emerging* is an enthusiast for tropical lands. He has written a book not wholly convincing but it has some truth in it. I flew over the edge of Amazonia and the center of the Congo. In the Congo I saw a great possibility and some definite development. In the Amazon, in my brief flight, I saw little hope.

Insect control has taken great advances. Ten per cent of the world's crops are ruined by insects. In the United States \$20,000,000 worth are annually destroyed. We are gaining on the insects rapidly by new drugs and new methods of applying them. Even the airplane is used successfully.

#### FURTHER OPTIMISTS

Greater opportunity is not acquired in food production by increased area but rather by increasing crop yields. In Denmark and the Netherlands crops of over 40 bushels of wheat were produced when the world's average was 15 bushels to the acre. This was due to a better rotation of crops, the intelligent combination of animal and mineral fertilizers and the careful selection of seed forced upon the farmer by higher taxes. The same is true of wheat growth in the United States. Wheat is seldom produced in the State of Maine. But when it is grown they must get a yield of 30 bushels to pay taxes on the land. In the Dakotas 15 bushels will be profitable. In a recent issue of *Life Magazine* there was an article on hormones produced artificially which promoted plant growth. They have been effective in making the pineapple crop of Hawaii more productive and in the Western States the apple crop was giving seven million extra bushels of the fruit annually when dusted with hormones. I have no need to tell about the importance of hybrid corn. It has increased our yield tremendously. Recently it was introduced to hungry Italy and the results were astonishing. Bromfield claims that the Southwest was under a sub-normal rainfall for three years and yet they had bumper wheat crops. This was because the wheat straw of the last year's crop was chopped up

and worked 5 inches underground by sub-soilers which rip up the ground to the depth of 20 inches and give air and moisture. All the water falling on the soil is salvaged even though it is of a torrential sort.

Gilbert White, a geographer, has written an excellent article, one worth while for your reading. It is entitled, "Towards an Appraisal of World Resources—New Views of Conservation Problems." It is made complete with an extensive and varied bibliography on conservation. It is anti-Malthusian. His conclusions are that balanced appraisal of world resources, which is the only solid basis for an answer to the current question of population out-distancing resources, is slowly taking place.

Sir E. John Russell gives a meaty reply to Aldous Huxley, a Neo-Malthusian, in *Food and People*, a UNESCO publication. He disagrees with the arguments of Huxley completely. In fact Huxley's points are born of a general pessimism and are not well founded. Russell is a leading agricultural expert of England. His thesis is that the way of mankind has always and will always be hard, but that well directed he will solve his problems. In a relatively short article he masses together a great many facts and it is most interesting. He even has hope for India.

The United Nations Food and Agricultural Organization is much concerned over the question and doing some excellent work, but it is not doing enough. Blair Bolles in a very short article on "Food and Diplomacy" tells some of the things they are doing.

Norris Dodd, director general of the F.A.O., tells us of two plans to increase the world's food supply. One is to train men to teach people in backward areas or under-developed countries in producing more food. Van Valkenburg of Clark University has been chosen head of a committee by the International Congress of Geographers to do exactly the same thing. In a recent number of the *Readers Digest* is the story of a practical missionary in Iran who is leading the way to make abandoned Iran produce fine crops. The second plan is for nations producing a surplus to continue to do so without danger of a price breakdown by having the surplus sent to areas in need of food. Lack of transportation and a failure of economics have caused many a famine. I have it from a Chinese student that they are suffering from lack of food on the densely populated Chinese coast while in the interior there is no suffering. This plan is an excellent one.

In Moulton's book he has a chapter on "Potentials of the Next Century" in which he states that when one contemplates the progress made in the last 25 years, the prospect for the next century can hardly be overestimated.

Well, I am worried about the future of world food. And I am worried about the present situation. And I am worried about the world if we have another war. But if we have peace, and if we have some sort of international co-operation, and if we put our brains together, and if I can slow down in producing grandchildren, I believe we will have at least two good meals a day.

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## MANIOC

MINNIE E. LEMAIRE

Mt. Holyoke College

Manioc, a most important plant of the tropics, if mentioned at all in most economic or regional geography books, generally receives more or less passing notice. Very likely this results from the difficulties in trying to find accurate information concerning this crop and from the fact that it does not enter into a major role as an export-import product. Yet we find it ranking at least among the five oldest cultivated plants in the western hemisphere and possibly as old or older than any cultivated plant of the eastern hemisphere. Manioc is one of the most important plants, along with maize, which the West has given to the East and today it probably rates as one of the ten or twelve most important sources of food in the world and bears a rank of first order as a foodstuff for millions of people in the tropical countries thruout the equatorial zone. In South America it has the same relationship to the tropics as the "Irish" potato has to the highlands.

### NAME-ORIGIN

The plant has various names in various regions and this, too, represents a difficulty in tracking down information. Contained in the list will be yuca, yucca, manioc, mandioca, cassava, casabi, manihot and guacamote (Mexico). The Aztecs in Mexico gave it the name "tree-potato." Tapioca—a refined product of manioc—derives from a Brazilian word meaning "pudding."

As with many plants the exact center of origin cannot be definitely located. Certainly the pre-Columbian period saw it well established in many sections of northern South America, Central America, and the West Indies. At least forty-two species are spontaneous in America, mostly in Brazil, some in the Guianas, Peru and Mexico, but not one in the old world. Most authoritative sources claim that manioc is indigenous to Brazil because here are found the greatest number of plants, wild and cultivated, the largest number of names for the many varieties of manioc and a great relative dependence on this product as a food in the subsistence culture of the natives.

The Portuguese traders early transported and introduced manioc to the Western Congo area where it is now one of the most

important foodstuffs. The spread to the rest of Africa as well as to the Southeast Asiatic area such as Malaya and the East Indies, especially Java, took place during the 16th and 17th centuries.

Botanically manioc belongs to the spurge or milkweed family (Euphorbiaceae) and has a milky fluid or latex. Other members of this family group are Hevea rubber, poinsettia and castor bean.



FIG. 1. Mandioca—about 8 months old—near Marilia, Brazil.

The principal value of manioc lies in its tuberous roots. Of the numerous species of manioc, *Manihot esculenta* or *Manihot utilisima* seem to be most commonly cultivated (Fig. 1).

#### CHARACTERISTICS

The plant is somewhat shrubby and ranges in height from 3'-18' (Fig. 2). Bitter and sweet manioc, probably developed from offshoots of the same species, represent two varieties of the plant. Both contain a glucoside closely related to prussic or hydrocyanic acid, which at times is quite toxic and deadly. The poison is found in the skin or just beneath the skin and may be removed by heating the root because the acid is volatile, or by pressing out the juice. Sweet manioc, generally used for food, contains less acid than the bitter manioc, preferred in the commercial field, but there

is evidence to show that sweet manioc contains a much larger amount of prussic acid when moved from high altitudes to lower elevations. The length of the growing period seems to have some influence on the amount of poison because it builds up to a maximum in about six months and then the percentage progressively diminishes.

In the time scale of growth, the plant is ready in 10–18 months for forage, in 15 months for the table and in 18–24 months for the more demanding and particular industries. The percentage of starch in the roots reaches its maximum (and probably its optimum) at 20–22 months when it may be expected to be 35 per cent by weight. The Saracura variety of Brazil is claimed to have a 36.69 per cent starch content but, overall, a normal figure of expectancy would be 25 per cent. Two maxima in the growth period are recorded; one after 9 months when the plant has lost its leaves and the second at the end of another year when the root has doubled in size but has somewhat more than doubled its starch content.

#### CONDITIONS—REQUIREMENTS FOR GROWTH

Manioc, not requiring great care and easily cultivated, produces more food by weight per unit of area than any other food crop. Propagation is done by planting 8"–10" cuttings from the middle portion of mature stalks about two-thirds in the soil and 4'–6' apart. Ninety per cent germination is the general rule. The plant has few serious pests and diseases and one of the worst is *Xanthomonas manihotis*, a wilt disease first isolated from *Manihot utilissima* in Brazil. When grown for subsistence the problem of storage is easily solved by leaving the crop in the ground until needed.

Climatically speaking, manioc is grown in most of the A zone (Köppen)—Af, Am, Aw, in some of the C zone—Cw in America and South Africa, Cfa in America, and in some of the B area in America. Altitudinally it may be found from sea level to 7,000 feet. This infers that the frost free period extends for at least eight months, altho ten–eleven months provide a much heavier yield. For the most part growing is restricted to areas having a mean average temperature of about 76°F. with a slight range. It produces in areas having less than 20" precipitation as well as in those having 100" or more. A fairly high relative humidity de-

mand means that coastal areas are preferred. In Java, because the crop requires less water than many other tropical crops, cassava goes on non-irrigated lands. The practice in the past has been to plant before the rains but lately in sections of Brazil new plantings have been made in May-June to escape the rains inasmuch as it has been found that rain keeps leaves and above ground stock growing well but roots do poorly. Also such planting seemingly reduces bacteriosis—one of the diseases.

Swampy and saline areas are prohibitive to growth while light, rich sandy loams furnish ideal settings. The soils should be dry rather than wet. Because of manioc's drought-resistant nature it is especially well developed for sandy soils and for soils too dry for maize and many other tropical crops. Water is needed at the



FIG. 2. Mandioca root—grown to supply a flour mill then under construction on a fazenda near Marilia, Brazil—August, 1940.

beginning for sprouting but once the plant has taken hold seldom will it be a total failure in a long-continued drought period. If an underlying hardpan is present, roots will be prevented from penetrating too deeply. Because manioc is one of the plants least exhaustive to the soil, it should be seriously considered as a replacement or rotation crop for some of the more demanding ones such as maize.

#### AREAS OF GROWTH

Most of the areas producing manioc lie within the belt 30°N.—30°S. with slight poleward distensions principally into Brazil, the

United States and China. In the eastern hemisphere the Netherlands Indies' chief root crop, especially Java, is cassava which serves as a native food crop as well as for tapioca. The plant is almost entirely cultivated by the natives and is often used as a sort of extra plant because it is inexpensively and easily handled and yet gives large paying returns for the labor. The eastern regions of Java have the greatest concentration of growing fields. The manufacture of tapioca and other cassava products is generally handled by Europeans and Chinese.

The cassava plant was early introduced by the Spanish in the Philippines but apparently no great production was attained for the record shows 316 acres devoted to the crop in 1903. The islands of Cebu, Albay and Palawan account for about one-third of the production. Something of the same story is found in Hawaii where the 1919 record shows a production of 182,500 pounds valued at \$1882 and the 1930 record—1 acre on Maui. In Guam, Manihot—an indigenous starch-bearing root—yields cassava and tapioca. In New Guinea an inferior quality product grows as a weed in native gardens but it represents an excellent reserve item and probably should receive more careful attention as a regular crop. Other South Asia continental regions and islands which produce varying amounts are India, Burma, Ceylon, British Malaya, Straits Settlement, Unfederated Malay States, Siam and Indo-China. In Madagascar it is cultivated, by Europeans and natives alike, thruout the whole island except for areas above 1800 meters and in the desert regions of the southwest.

Africa has developed quite a dependency upon manioc. Three major agricultural regions as defined by Shantz list this as a major item. 1) Tropical forest, oil palm, rubber, cacao, banana, rice, manioc, chicken, goat region. Here in the Belgian Congo, Nigeria, Dahomey, Ivory Coast and Liberia sections manioc is interplanted with bananas, rice and maize until manioc gradually eliminates the others. 2) Tropical fruits, root crops, vegetables, maize, chicken and goat region. This area is poleward of the first and includes, in part, southern Belgian Congo, southern and central parts of French Equatorial Africa, southern Anglo-Egyptian Sudan, Portuguese Guinea and the Gold Coast. Here manioc is outstandingly important as the chief food product, so much so that it leads to a most unbalanced diet with resultant poor health. 3) Manioc, millet, sorghum, maize and livestock region. A belt pole-

ward of the second type, again, in spite of a drier climate, relies upon the starch from this root crop for a major portion of its food.<sup>1</sup>

In the United States because of the crop's preference for coastal regions with a relatively high humidity and a high temperature, only along the Gulf Coast from Florida to Texas can be found a suitable area for growth, but so far the farmers have not indicated much interest because maize suits them better. That which is grown is primarily the sweet cassava. In Mexico the states facing the Gulf Coast, Vera Cruz, Oaxaca, Tabasco, Yucatan and Chiapas cultivate with the greatest abundance. The Antilles group, especially the Dominican Republic, have a long history of use and need.

In Venezuela the small patches of manioc bear the name "conucos." In the eastern and southern parts of the country *Manihot utilissima* dominates, apparently indicating the influence of migrating Carib Indians, whereas *Manihot Aipi*—a sweet cassava—has become the favorite in the central and western sections.

In Brazil and Paraguay, the Tupi and Guaraní Indians used mandioca as a basal stock in their shifting agricultural pattern. In Brazil, today, the Executive Commission for Mandioca Products which was organized in 1942 as an attachment to the Federal Ministry of Agriculture supervises and initiates developmental plans, organizes and aids producer cooperatives, institutes production and marketing controls, has control over milling equipment and other installations and generally watches the whole industry. Subsidization of the national mandioca flour industry by requiring a mixture of mandioca in wheat breads existed in 1940 but apparently has been stopped, probably because of trade dealings with Argentina where wheat constitutes a prime consideration.

### PRODUCTION

As with any crop, production figures per unit area vary considerably but some comparative statements are useful. For instance manioc may yield up to 16-40 metric tons per acre, the normal flour yield being one-third to one-fourth of the weight of the root, and thus one acre can feed anywhere between 12-30 people. This means that the crop is about six times as effective as

<sup>1</sup> Shantz, H. L., *Agricultural Regions of Africa, Economic Geography* XIX, 1 [1943], 77-109.

wheat as a food producer. However lower figures of production seem to be an actuality. In Java, the variety *Mandioca Sao Pedro Preto* averages 20 tons per acre, while Mexico plans on obtaining six tons per acre. Generally the sweet varieties have a lower yield than the bitter ones, 10 tons as compared with 15 tons per acre.

The leading producers by countries, by acreage and by tonnage, appear for the most part in the following order—The Dutch East Indies, Brazil, Madagascar and French West Africa. In spite of poor statistics it probably can be truthfully stated that today both Asia and Africa surpass the Western Hemisphere as a producer.

#### MANIOC AS A FOOD

Manioc, as a foodstuff, constitutes a staple element in the diet of millions of people in Africa, the East Indies and other regions of Asia even tho it is recognized as inferior to maize. The American area still harbors a great interest in maize and beans; however, manioc rates first in Paraguay in tonnage and second in Brazil (sugar cane is first) and in other areas it appears on the menu twice a day almost every day in the year. The variety of forms of preparation is quite surprising. The leaves may be cooked as greens and the sweet manioc may be served as a vegetable, as for instance, like potato or parsnip.

Probably the greatest use is as a coarse meal or flour ("farine" or "Farinha") as bread or cakes. The Indians scrape or peel the bitter manioc, grate it and squeeze out the poisonous juice. Then the raw pulp is dried and sifted, made into thin cakes and cooked on a terra cotta pan or griddle. One advantage of farina is that it will not deteriorate if kept for a long period of time and will not be injured by insects. In Brazil variations on the plain use are many, for example, manioc flour seasoned with palm oil and pepper and mixed with boiled shrimps, locally known as *Vatapá*; or *Farofa*—toasted manioc flour; or *Beiju Curuba*—a fancy variety, prepared from grated cassava mixed with grated Brazil nuts; or *Beiju Teyca*—where grains of starch are allowed to adhere during the heating and make a most delicious confection when rolled up with butter, syrup or fruit preserve; or frozen *Açaça*—a jellied mass of manioc flour that has first been boiled in water, seasoned with salt and served on a dish of heavy banana leaves, fresh and pretty and green. The preparation of *mandioca* for home use involves rather

simple processes and can be done by almost any peasant at a relatively low cost.<sup>2</sup>

As might be expected of such an important crop, it also appears as a beverage where it might be served as an intoxicating drink somewhat resembling beer, as a warm drink such as Mingau—a sweetened hot drink of tapioca, water and milk—or as a tall cool drink with water, lemon and sugar.

In the temperate areas cassareep—the juice of the bitter variety—forms the base of the famous Worcestershire and other sauces and is finding increased use as a meat preservative.

Not only does cassava serve man's needs but it has also been found to be a good feed for stock, that is cattle, dairy animals, hogs and poultry. True, the feed is highly carbonaceous and needs to have nitrogenous grain feed mixed with it, but it is one of the most inexpensive feeds that can be grown.

#### USES OF MANIOC—COMMERCIAL

Up until the present, manioc constitutes the cheapest known source of starch and is much in demand by the natives in Java for laundry purposes and Brazil manufactures much starch as a sizing for its fast growing textile industry. At the Stica colony in Piribebuy, Paraguay, construction of a manioc starch factory was under way by February, 1948 and should add materially to the improvement of agriculture in the area.

Industrially the crop is processed in four general forms—dried slices, meal and flour, flakes and pearl tapioca, and compressed residue, with the United States importing principally flour and tapioca. Commercial production began in the 19th century in the East Indies and the Indian Ocean islands sponsored mostly by the Dutch and French.

As a starch it does remarkably well as a remoistening glue for postage stamps and the import of tapioca in the United States for the manufacture of adhesives and of paper sizes has shown remarkable growth lately.

Tapioca, as a substitute for wheat flour, enters into competition with arrowroot in biscuits, crackers, buns and porridges, because

<sup>2</sup> Landes, Ruth, *The City of Women*, Macmillan, New York, 1947 and Pickles, Alan, *Cassava in the Amazon Valley*, Agricultural Society, Trinidad and Tobago, Proceedings v. 42, pt. 2, June 1942.

it is easily digested. Probably the best and most widely known use of cassava in this country is that of Minute Tapioca—A General Foods product—with its plant located in Orange, Massachusetts.

With the increased knowledge derived from chemurgy this crop may very likely be one of the cheapest sources of alcohol, acetone, dextrin and glucose. In those areas where distilleries have been established with sugar as the chief source material and thereby run a rather short season, cassava may be used to feed the factories in the so-called off season and thus make for more efficient units and operation. Brazil stands to especially benefit from such an arrangement and experiments are already being carried out with this in mind.

#### TRADE IN MANIOC

Trade in manioc began fairly late for apparently it first appeared as an article of trade about 1896. Altho cultivation of manioc covers a wide latitudinal and longitudinal range, exports come from relatively limited sections. Before 1941 the Dutch East Indies, Madagascar, British Malaya, Indo-China, Brazil and the Dominican Republic held the export spotlight. As the exports originated in relatively few areas so likewise do a few countries dominate the import trade. The United States has led as a consumer nation, and, in Europe, Great Britain has ranked as the largest importer with France next. These three have generally controlled the import market.

Java and Madura, until the 1940's easily led in exports. Java's product has attained a good reputation and has had little competition in the United States and British markets. The second World War disrupted this market and altho the Java and Siam product has started to reappear the quality has been poor. As might be expected Madagascar depended on France as its chief market. Indo-China and Reunion also furnished the French with a portion of their imports.

The products which are exported do not have clear-cut definitions from one country to another but the names appearing most consistently are manioc meal, manioc starch, manioc roots, tapioca, tapioca meal, tapioca pearl and seeds.

Because the production of manioc in Brazil has not been efficient (thus boosting production and marketing costs) or qualitative, this country, ordinarily, cannot meet competition in a number of

the foreign markets. The boom periods of both World I and II gave Brazil a start but a drop followed immediately after the 1917-1918 peak and is following the same trend today. In an attempt to maintain at least a good part of the trade in the coming years the General Foods Corporation has aided and encouraged the growth of manioc for commercial purposes by trying to be objective in setting up specifications for grading the product, by coding the product, by correlating data on analysis of the samples taken, by supplying services of technicians to the producers and by trying to stabilize the market before reentrance of Java into the foreign trade market. In order to further show their interest their Minute Tapioca Division purchased about 7000 tons in 1948. Estimates indicate that Brazil in 1942 was manufacturing about 35,000 tons. Figuring that the United States ordinarily will consume 110,000-150,000 tons then Brazil could obtain a fair proportion of the United States market if this were all exported.

#### CONCLUSION

With the great interest in the tropics and their development it would seem that considerably more attention should be given to manioc and its place in the economy of countries, not only for its food value but also for its industrial and commercial potential. With the plans now being initiated, such as the Ten Year Development Plan of the Colonial Ministry of the Belgian Congo issued in June, 1949, the opportunity is present and more thought should be spent on servicing the immediate area with its own products rather than servicing the needs of the temperate areas. A more adequate knowledge of the tropics, in tropical terms rather than in middle latitude jargon, might be started with a good evaluation of what manioc has to offer now and in the future.

## THE NATIONAL COUNCIL AT WORK

Four committees of the National Council have made reports; these reports are considered by the Executive Board and the Publications Committee. If the report is of 1. general interest and use to all geographers, and 2. useful in the field of teaching it may be issued as one of the special publications of the National Council, such as a Professional Paper. Two such professional papers are now in process of publication: 1. the report of the *Committee on Preparation of Bibliographies on Lists of Maps* and 2. the report of the *Committee on Compilation of Suggestions and Bibliography for Use by Curriculum Committees*. The first named committee report was prepared by Mrs. Katheryne T. Whittemore, *Chairman*, Margaret Chew, and George Corfield; the second-named report was prepared by Mamie L. Anderzohn, *Chairman*, Annice D. Elkins, Monica Kusch, and Villa B. Smith. Two additional committees, which reported to the Executive Board November 24 and 25 at the Chicago Meeting, are 1. the *Committee on Color Transparencies* and 2. the *Committee on Survey of Research in Geographic Education*. A preliminary report of the Color Transparency Committee was published in the JOURNAL OF GEOGRAPHY, Vol. 49, No. 5, May, 1950, pages 200-206. Miss Elizabeth Eiselen is *Chairman* of the committee.

Professor Arthur W. Carthew of Los Angeles City College has accepted membership on the *Committee on Tests*. Mr. Carthew has had wide experience in testing, and has made many contributions to this subject in his home college and state, and thru his work with the California Council of Geography Teachers.

Among those who served as hosts and hostesses at the Chicago meeting (the list is not complete as this goes to press) were: Barton, Byron K., Eastern Illinois State College, Charleston; Branom, Fred K., 10325 Leavitt St., Chicago 43; Burgy, J. Herbert, Dept. of Geography & Geology, Bradley Univ., Peoria 5; Cálef, Wesley, Dept. of Geography, University of Chicago, Chicago; Colby, Mrs. Charles C., Navy Pier School, Chicago; Cunningham, Professor Floyd F., Southern Ill. University, Carbondale; Finney, Mrs. Mildred, Navy Pier School, Chicago; Gross, H. H., Concordia College, 7400 August St., River Forest; Kohn, Dr. Clyde F., Dept. of Geography, Northwestern Univ., Evanston; Kusch, Monica, Navy Pier School, Chicago; Neuman, Harold L., 2719 Noyes St., Evanston; Reineman, Martin, Dept. of Geography, Northern Ill. State Teachers College, DeKalb; Trager, Louise M., Lakeview High School, 4015 N. Ashland Ave., Chicago 13; and Wetterlund, Alice, 10960 Prospect Avenue, Chicago 43.

Miss Mamie L. Anderzohn of Oak Park served as the Coordinator of local arrangements. The National Council expresses its gratitude to Miss Anderzohn and the others who contributed so much to the meeting.

LOYAL DURAND, JR.  
*President*

## GEOGRAPHICAL PUBLICATIONS

**James C. Malin. Grassland Historical Studies: Natural Resources Utilization in a Background of Science and Technology. Vol. 1, Geography and Geology. (Printed by the author, 1541 University Drive, Lawrence, Kansas. Lithoprint from typescript; paper cover) 1950. \$2.50.**

This is the first of three projected volumes which, the author explains, are to contain only fragments of a series of full-length books originally planned. Despite its title, the present volume consists of two specialized and disconnected parts. The first is called "Wood and Minerals for Fuel and Building Materials" and is devoted essentially to the interesting story of the geological exploration of Kansas and Nebraska and its influence on immigration as revealed by contemporary accounts, especially of the period 1840-1860. The second and longer part is devoted to the early history of Kansas City, Missouri, especially in the eighteen-fifties and 'sixties. Again there are numerous quotations from contemporary sources, including many from local newspapers and journals long since forgotten. Full details are given of trade and commerce in certain years and one is able to form a very clear picture of the city in its pioneer days. Reproductions of some early prints add to the interest of the volume.

*University of London*

L. DUDLEY STAMP

**Mel Scott. Metropolitan Los Angeles: One Community. 181 pp., 31 maps and plans. 107 illustrations. The Haynes Foundation, Los Angeles. 1949. \$5.00.**

The author of this book has recognized the need for up-to-date materials on the Los Angeles area and has planned the book to serve as a supplementary text for senior high school classes in Los Angeles and Orange Counties. The book should be extremely valuable and interesting, however, to all citizens—especially to the teacher of elementary and secondary students.

In an age when urban centers are continuing to grow (the 1950 Census shows that 104 cities now top 100,000) it is necessary that materials be made available on the nature of the urban environment in order that future citizens can understand better the problems of living in large urban centers. This book on the Los Angeles metropolitan area makes such information readily available for instructional purposes.

The author, Mel Scott, is well qualified to write on metropolitan development and planning. He has served as a consultant in urban redevelopment and has aided in the development of community study programs in San Francisco and other Southwestern urban centers.

Mr. Scott opens his book with a short chapter on the natural conditions and population facts of the area. The beginning of the metropolis is outlined in Chapter 2 and its historical development is brought up to date in Chapter 3. Subsequent chapters present discussions of the character of its population, its economic activities, public utilities, transportation facilities, the nature of metropolitan living, education, recreation, and the social problems which accompany that urban growth. The final chapter demonstrates the necessity for over-all planning for the metropolitan area and outlines how this objective can best be achieved.

The book is excellently and profusely illustrated with photographs, maps, and other visual aids. Especially noteworthy are the land use maps of selected cities within the metropolitan region.

Teachers of geography at all levels of instruction will find the book valuable not only for the facts that it contains, but more for the analysis that Mr. Scott makes of the problems of urban growth characteristic of all American metropolitan centers.

*Northwestern University*

CLYDE F. KOHN

**L. S. Berg. *Natural Regions of the U.S.S.R.*** Translated by Olga Adler Titelbaum; edited by John A. Morrison and C. C. Nikiforoff. xxxi and 436 pp. The Macmillan Company, New York. 1950. \$10.00.

This translation of Professor Berg's *Priroda SSSR* (1937) continues the selected series now appearing under the Russian Translation Project of the American Council of Learned Societies, and constitutes the project's second translation of a geographical work, the first having been Balzak, Vasyutin and Feigin's *Economic Geography of the U.S.S.R.*, which was issued in 1949. Since the *Economic Geography* approaches its subject from the standpoint of commodities and specific industries, it was accompanied in the original by a parallel textbook of regional economic geography which, unfortunately, has been unavailable for translation. The present volume thus represents an admirable choice for translation on the part of the committee, for it not only helps in part to fulfill the lack of a regional work, but makes available to American students the summation of a lifetime of observation and study by one of the Soviet Union's preëminent naturalists and physical geographers.

Berg's "natural regions" consist of climate and vegetation belts over the lowlands of the USSR, and of specific mountain groups elsewhere, within which the climate, relief, soils, vegetations, and animal life are successively described. Although geological influences on landforms frequently are referred to, there is no attempt to consider economic mineral resources. (The tone thruout is politically dispassionate.) The several climate and vegetation maps of the original edition have been redrawn and are included; in addition, physical landscape elements are effectively illustrated by more than eighty photographs which were especially gathered for the American edition and form a valuable amendment. The volume is excellently indexed, and the editors have added a glossary of the more frequently used English and Russian technical terms.

*Indiana University*

WILLERT RHYNSBURGER.

**Thomas R. Carskadon and Rudolph Modley, U.S.A. *Measure of a Nation.*** Paper. 101 pages. The Macmillan Company, New York, 1949.

A vivid pictograph presentation of the economic life of the United States. Expenditures for: Food, Liquor and Tobacco; Clothing, Jewelry and Personal Care; Housing; Household Equipment and Operation; Medical Care; Education; Transportation; Recreation; Religion and Private Social Welfare. A forecast of expenditures in 1960 in each of these categories, and an estimate of additional expenditures needed to meet minimum requirements for all our citizens.

Pictographs also present: Past and Future Spending for Capital Goods; Cost of a 15-Year "Better City" Program; Cost of a Regional Development Program; Money Spent for Government Services; General Government Expenditures, a Look Toward the Future; Public Debt per Person. The Public Debt diagrams showing the vast increase of debt since 1913 are enlightening as well as depressing. Nothing is given, however, on taxes, direct or hidden.

This graphic presentation of our country is worthy of a careful appraisal by high school students. It should arouse many questions as to policy in relation to facts.

*John Hay High School, Cleveland, Ohio*

VILLA B. SMITH

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